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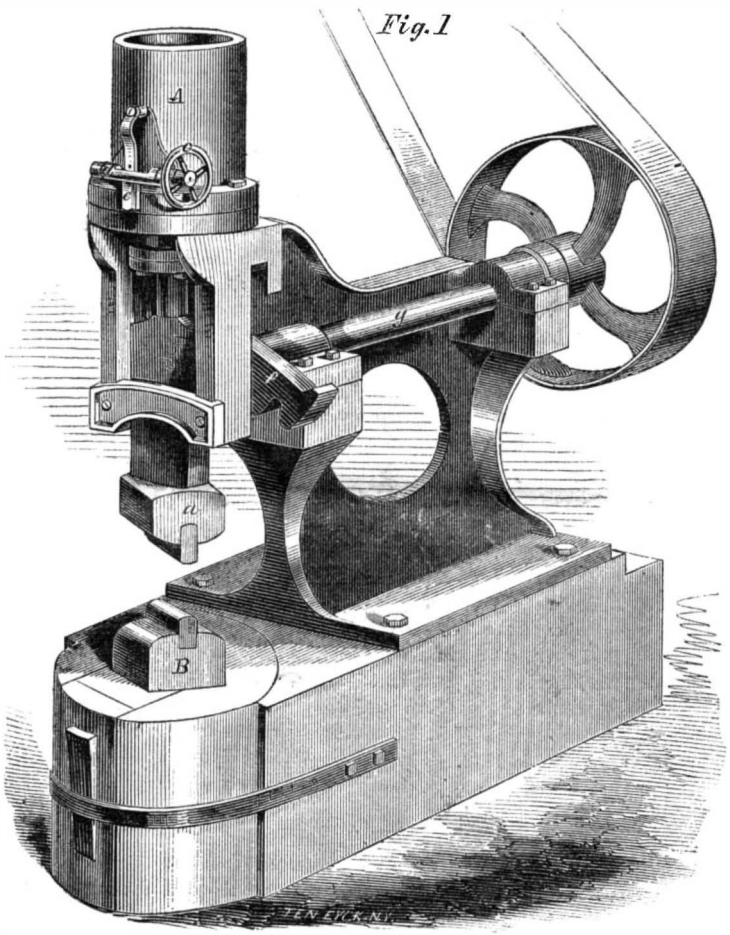
IMPROVED ATMOSPHERIC HAMMER.

A few years since, Mr. Nasmyth invented, in England, a steam-hammer which has excited the astonishment of people by the great range of its power, and the extreme delicacy with which it can be adjusted. The operator, by placing his hand upon the handle of the regulating-valve, could at one moment drop a hammer of 12 tuns weight freely from a hight of six feet, with a force which would spatter a four foot cube of hot iron as if it were a mass of snow; and, at the next, could interpose a cushion of steam so that the same immense weight would fall with a blow just sufficient to crack a hazelnut which he held in his fingers. It is even stated that a greased egg has been placed upon the anvil, and this monstrous hammer allowed to drop upon it with a blow so nicely adjusted as to take off a portion of the grease without breaking the shell! Mr. Nasmyth took out Letters Patent in this country; but he charged so high a price for the right to build one of his hammers—$1,800, if we remember rightly—that few of them were introduced here, although they were deemed almost indispensable in large establishments. The urgent demand, combined with the high price of Nasmyth's license, stimulated our inventors to devise some mode of accomplishing the same results without infringing the Englishman's patent, and several patents have been taken out for atmospheric hammers. Last year, at the fair of the American Institute, we heard a tremendous pounding, which seemed to shake the whole building; and, on approaching the place whence the noise came, we saw one of those air-hammers in operation. The exhibitor, with his hand upon the regulating-valve, quickly reduced the force of the blows; and, taking a handful of filberts from his pocket, began to crack them between the same hammer and anvil which had just before been coming together with such awful force.

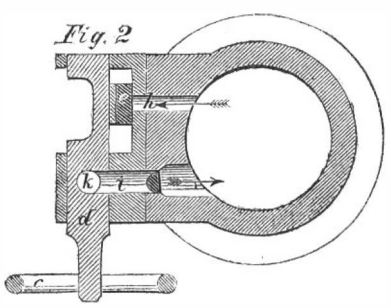
Our engraving represents an atmospheric hammer of very simple and compact construction, which has been improved by subsequent inventions since the original plan was illustrated and described on page 65, Vol. X., SCIENTIFIC AMERICAN. Fig. 1 is a perspective view of the whole machine, and Fig. 2 is a horizontal section through the cylinder and tube-box, showing the arrangement of the valves. A is a hollow cylinder, open at the top and closed at the bottom. In this cylinder an air-tight piston works, connected by a rod, *b*, which passes through a stuffing-box, and is attached to the hammer, *a*. The hammer is raised by the revolutions of the cam, *f*, which is fastened upon the shaft, *g*. As the hammer rises, it carries up the piston, producing a partial vacuum in the cylinder, and when the hammer is released from the cam, the pressure of the air upon the upper side of the piston is added to the weight of the hammer in giving force to the blow. The force of the blow is adjusted by leaving a cushion of air of greater or less density in the cylinder below the piston. The density of this cushion of air is adjusted by means of two valves, which will be readily understood by an inspection of Fig. 2. Air is admitted to the cylinder through the opening, *i*, and it is prevented from escaping through the same opening by means of a conical valve, as shown. The shaft, *d*, acts as a stop-cock by which the flow of the air into the cylinder through *i* may be either regulated at pleasure or entirely cut off; *h* is an opening for the exit of the air, which is closed by the valve, *e* (Fig. 1). The force of the blow is adjusted by varying the pressure on this spring; and this is done by turning the shaft, *d*, one-half of which is cut away opposite the spring, so that it operates as a cam in its pressure on the spring. Let the lower portion of the cylinder be furnished with a sufficient supply of air, and let the shaft, *d*, be so turned as to give a blow of the desired force. Now, if the iron which is being hammered is turned from its edge down upon its side, a portion of the blow will be expended in expelling some of the air through the opening, *h*; and thus the blow will immediately adjust itself, notwithstanding the increased length of the stroke, in accordance with the pressure upon the spring and valve, *e*. The opening through the shaft, *k*, into *i* varies with the pressure upon *e*, to which it is adapted as nearly as may be; care, however being taken to have it sufficiently large for an ample supply of air.

Fig. 1



HUGHES' ATMOSPHERIC HAMMER.

Fig. 2



The journal-box of the shaft, *g*, which is near the hammer, is placed upon an india-rubber spring, in order to soften the blow of the cam. It will be seen that the air, which acts as a spring by its pressure on the piston, causes a very quick descent of the hammer, and thus permits a rapid succession of blows, which is absolutely essential for many purposes, and which cannot be obtained with the Nasmyth hammer.

Persons desiring further information in regard to this hammer may address the Novelty Works, New York City.

SANDED COTTON.

A planter, writing to the Charleston *Mercury* on this subject, states that the Manchester Chamber of Commerce, and all those who have denounced the practice of "sanding cotton" by planters as a fraud and a disgraceful cheat, are wrong in their denunciations. He asserts, with good reason, that no planter in his senses would resort to such a practice for the purposes of fraud, when fine clean cotton commands 12½ cents per pound in the market; while the sanded only brings 7 cents, which makes a difference of more than $20 on the bale. He explains the manner in which the cotton becomes filled with sand, as follows:—

"Throughout the pine-woods region of South Carolina—which are the best and most certain lands—the cotton opens early and rapidly during the months of August and September, and is subject to the beatings and peltings of the heavy rains and storms peculiar to that season. The soil being light and porous, and, withal, very black, the same spatters upon the cotton, beats it out, and sometimes even into the soil; and it never can be made to look decent again."

This explanation of the great amount of sand found in American cotton should remove the imputation of fraud from the planters. The same correspondent of the *Mercury* states that this sand can only be removed from the cotton by the "cotton screen"—a machine which has been almost entirely abandoned, because the cotton-buyers denounced its use as injurious to the staple. During last winter he screened 12,000 lbs. of seed cotton, and knocked as much sand out of it as a four-horse team could draw on a good road. He did not get one cent more per pound for it than unscreeened, sandy cotton, because the buyer asserted its staple was injured by the screen. No one is defrauded in the sanded cotton by the planters; the buyers know that it is "storm cotton," and just give the less for it. The present cotton-picking season has been very favorable, and but little sanded cotton will be sent to the market. This explanation of the causes of sanded American cotton entirely changes the whole moral bearings of the question.

A train of 41 cars run off the track on the New York Central Railroad, at Albany, on the 2d inst., by the wheels slipping on the ice which had formed on the rails. The brakes were inefficient to stop the train when passing down the incline.

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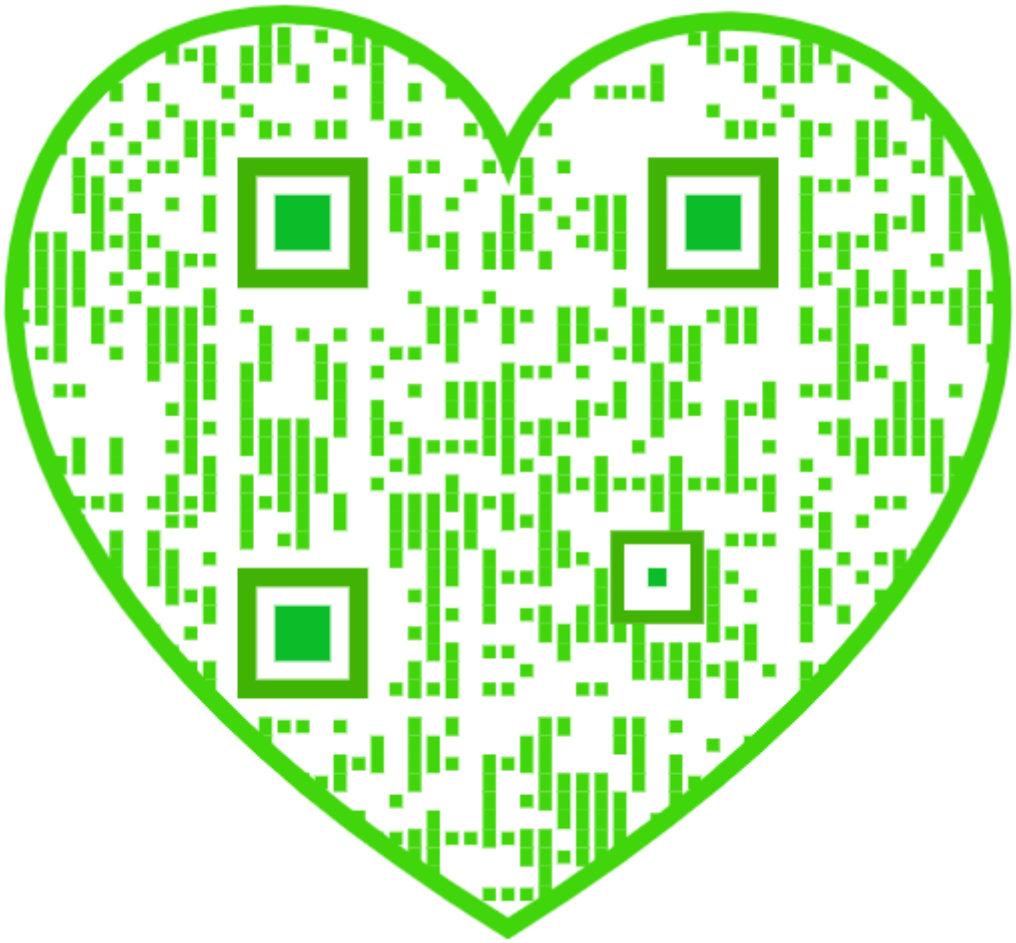

THE MANUFACTURES OF PATERSON, N. J.

MACHINE AND LOCOMOTIVE BUILDING—COTTON SPINNING AND WEAVING—THE WOOLEN MANUFACTURE.

[Continued from page 299.]

Benjamin Buckley, now State Senator, in 1842, began the manufacture of spindles, fliers and rings, for cotton and silk factories. Mr. Buckley employs some 20 hands in this business, doing work for all parts of the country where spinning by machinery is carried on. He has also engaged in manufacturing cotton yarn. James Dunkerley & Co. have recently completed a new shop for making fluted and plain rollers for flax, wool and cotton machinery. Tunstall & Beggs have commenced to make machines for rolling and stretching wire, as well as most descriptions of millwright work. R. Thompson's Passaic Foundry and Machine-shop is about entering the lists as a public competitor.

The Empress Eugenie is deserving of more than honorable mention by the mechanics of Paterson for her making "broad the phylacteries," or translating the feminine skirt from its old elliptic and parabolic curves to the graceful circle. Ten or a dozen shops, employing nearly 150 persons, are constantly at work, making braiding machines, drawing and tempering steel, braiding the steel and forming it into skirts. William Crossland was the pioneer of this description of industry, having gone into it four years ago, before an American-made hoop had been trundled into the market. Mr. Crossland still employs 20 to 25 men. He was followed by W. H. Chamberlain, Jr., who carries on every process in the art, converting a bar of steel into the full-blown article. This is the only establishment in the Union where the entire operations are carried on. Considerable quantities of wire are also made for watch springs, sewing-machines, and the like. Watson & Fielding and Watson & Romaine, are among those who have lately embarked in the same business.

The manufacture of flues, smoke-stacks, brass domes, and other descriptions of ornamental work for locomotives, has for several years been an important item of industry, furnishing steady employment to 75 or 100 persons. The most extensive concern in this line is that of N. Lane, which has been in operation for many years. The best testimonials as to the character of brass work may be seen on Paterson locomotives. The brass mountings for those magnificent steam fire-engines, lately turned out at the Novelty Works, were from Mr. Lane's shop. Messrs. R. Hayes, Wm. Cundell, R. McCulloch & Co. and Curran & Bowering are also engaged in the same pursuit.

Brass casting and finishing has become a distinct business only during the present year. In 1854, McNab, Carr & Harlan, having obtained a patent for a valuable improvement in globe valves and gage cocks, opened a shop in New York; but finding their space entirely too contracted for their growing business, they erected a new factory in Paterson, driven by steam power, and removed to it last spring. All descriptions of brass work are carried on at their establishment, together with making patent alarums for boilers. These not only sound the note of danger, when water is too low, but force it into the boiler. The number of employees is about 40; the office is at No. 16 John-street, New York.

In giving a historical sketch of machine-making, it is proper to refer to some concerns no longer in existence. In 1831, Benjamin Brundred purchased the Oldham mill, one mile out of Paterson, where he conducted the business for about five years. His mill having burned down, Mr. Brundred organized an association, entitled The Paterson Machine Company, which erected works near Congress Hall. In 1847 they underwent a similar fate, when Mr. Brundred returned to Oldham and rebuilt that concern. Since his death it has passed through a number of hands, and is now owned by an English interest, represented by Wm. & Chas. Hodges. Paul & Beggs, George Bradley & Sons, and Evans, Thompson & Co. were also at one time similarly engaged.

A rolling mill and nail factory was established, in 1811, by Samuel Colt & Co. Their mill occupied the site of the gun factory, and there the rolling of hoop and sheet iron, boiler plate and sheathing copper was carried on. In the nail factory nails were cut by machinery and headed by hand for a time; but, finally, the whole process was performed by the former. About 70 hands were usually employed. The concern continued in existence until 1826, when it closed.

A wire factory was also established, about 1812, by Oshea Wilder, continuing in operation until after the termination of the war. Most of the wire was used for cotton and wool cards, and young people were employed to set the teeth by hand in their several homes. It was not till some time afterwards that Whittemore's beautiful invention was introduced into Paterson, and the card factory set agoing, which continued to be busily engaged until a short time ago.

The Gun factory, a large and substantial stone building, was put up, in 1836, by Col. Samuel Colt, who organized a joint stock association, entitled The Patent Arms Company. Two years afterwards he sold out his interest and removed to Connecticut, where he now has his famous pistol and gun armory. The factory was run about a year longer, when it was closed and the machinery disposed of. The building is now in possession of John Ryle.

The total number of persons employed on locomotives, stationary engines and machinery is, therefore, about 2,000, nearly half of whom are engaged on the first only. At the present rate of building, 135 of these are turned out every year; but the establishments in Paterson are capable of increasing that number at least 50 per cent, and, before the break-down in 1857, had been building 180 per annum. The average wages paid to all round will be about $10,000 per week, or half a million annually, to which, probably, $100,000 should be added for salaries. The value of work turned out is not far from two million dollars per annum.

The early suspension of the Society for Establishing Useful Manufactures threw the industry of Paterson upon private resources, and developing the principal of individualism to a greater extent than in many other manufacturing communities. In the eastern States flourishing cities have been built up by corporations of wealthy capitalists, under whose fostering care not only productive industry grew up, but science, art, educational and religious institutions received abundant encouragement. In Paterson it was different. With very few exceptions, almost every manufacturer started, financially, at zero, enlarging his establishment as the quicksilver expanded in his purse. In prosperous times they prospered, but with the recurrence of disaster were too likely to go under. At the same time, the general suffering is much less and the recovery more rapid than when the public are told to "stand from under" enormous corporations, as they tumble to the ground.

Reference has already been made to the attempt at spinning candlewick in the society's mill by John Parke. On leaving it he put up a frame building on the site of the Phœnix mill, and, in 1808, commenced operations. About the middle of the war the factory was rebuilt half its present size. Mr. Parke shared the fate usually experienced in 1816. The building lay idle for a number years, when it was purchased by a company who turned it into a flax mill.

A lease of the Essex mill site had, in 1802, been made to Kinsey, Crane & Co., who commenced making paper two years afterwards. During the war this was converted into a cotton factory, in which condition it has so continued. In 1856 it was enlarged by its late proprietor, John Colt, and now contains 4,000 spindles, consuming 10,500 lbs. of cotton every week, and employing 90 operatives. The yarns, like most of those made in Paterson, are sent to the Philadelphia market. Griffith King is superintendent.

In 1811 Capt. Richard Ward formed a partnership with Robert King, and built what is now known as the Nightengale or Henry Clay mill, where they carried on spinning and weaving kerseys for government to clothe the troops with, until the general prostration of 1816. Twelve years afterwards it was purchased by the late James Nightengale, who enlarged and ran it as a cotton mill for many years. Part of it is still occupied by Dr. Nightengale, who employs 25 hands in making yarns. The number of spindles is 1,150, and the consumption of cotton about 3,200 lbs. per week.

The war of 1812-15 gave a powerful stimulus to manufacturing enterprise. During that short period we find the following cotton factories put in operation:—Pratt's mill, now the Franklin bleach-works; Ward & Johnson's, now the Oakman mill; Henry Morris's, now the Hamilton mill; Robert Collet's, now Danforth, Cooke & Co.'s; A. & R. King's, now on the same premises; D. Holseman's, now Todd & Rafferty's. The Beaver mill had been manufacturing cotton since 1809. Considerable hand-loom weaving was carried on in private dwellings. The brothers King, who are now nearly the oldest inhabitants of the place, were the first to introduce power looms, which they themselves made after a model obtained from Scotland. Of these establishments, the only ones which continued to run during the collapse of 1816 were those of Messrs. Holseman & Morris. The latter was a son of Robert Morris, the eminent revolutionary financier and patriot.

Meanwhile attempts were being made at Baltimore and the East to weave cotton duck; but the yarn, not being doubled and twisted, had to be heavily starched to prevent chafing in the reed, thus rendering it useless for sail cloth, owing to its tendency to mildew. Linen duck had, indeed, been made in Paterson by hand as early as 1816, and a combination of linen and cotton tried. But in February, 1822, the first cotton duck, without any kind of dressing, was produced by John Colt in the Passaic No. 1 mill; and in March, 1824, Mr. Colt brought out the first piece of cotton duck ever woven upon a power loom. This may properly be regarded as a new era in the cotton manufacture. Colt's duck has ever since maintained the position it then secured, and still rules the market. The mill in which it was produced has more than doubled its former capacity, and now contains 2,250 spindles and 50 power looms, giving employment to 120 operatives, several of whom have been connected with it nearly 40 years. The quantity of cotton consumed weekly is 10,000 lbs., and the annual product about 450,000 yards of duck. The yacht *America*, which won the celebrated victory in England eight years ago, was clothed with sails made at Mr. Colt's mill. It may be stated, in passing, that the first power loom in that factory was put up by Thomas Rogers, the pioneer locomotive builder.

Passaic No. 2 cotton mill was built by the Society for Establishing Useful Manufactures in 1832, then leased and finally sold to Mr. Colt. It is a substantial four story stone building, and now contains 5,000 spindles and 65 looms, employing 120 operatives. Weekly consumption of cotton, 11,500 lbs. Part of the yarn is sent to the Duck mill; the remainder is woven into muslins, Canton flannels, &c. This establishment, together with Passaic No. 1 and the Essex mill, is now owned by E. Boudinot Colt. The whole number of employees is 330, who receive in wages about $60,000 per annum.

Mention has been made of the Phœnix mill. In 1822, it was purchased by Velasquez & Traverse, of New York, and by them converted into a flax mill. Two years aftewards the proprietors were incorporated under the title of the Phœnix Manufacturing Company, about which time the factory was enlarged to its present extent. It is now the largest of its kind in the State, employing 180 hands, who have been engaged in spinning cotton yarns and weaving duck since 1830. Number of spindles, 7,000; of power looms, 60; weekly consumption of cotton, 12,000 lbs. J. H. Sprague is president, and W. H. K. Bibby, secretary and superintendent.

The following comprises the statistics of the several cotton mills in Paterson, in addition to those already given:—

Industry mill (Henry M. Low's). Number of spindles, 2,500; of employees, 65; weekly consumption of cotton, 7,000 lbs., made into yarns. The mill is managed by the proprietor.

Harmony mill (Wm. Adams'). Number of spindles, 2,500; of power looms, 36, of employees, 80; weekly consumption of cotton, 3,000 lbs., spun and woven into mosquito nettings, crown linings, &c., and afterwards bleached on the premises.

Snyder, Rea & Co., in the Gun mill, run 1,728 spindles and employ 40 hands in spinning. Consumption of cotton per week, 4,500 lbs. Went into operation the present year.

Osborne, Buckley & Co., in the same, also commenced in 1859, and run 1,152 spindles, employing 25 hands at spinning, and consuming 3,000 lbs. of cotton per week.

John Oakman runs 2,700 spindles and employs 75 operatives, consuming about 7,000 lbs, of cotton weekly, which is made into yarns.

Dickey & Heathcott, in the Hamilton mill, run 2,250 spindles and employ 40 hands. Weekly consumption of cotton, about 6,000 lbs.

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A. Prall & Co. run 5,352 spindles and 28 cards, consuming weekly 14,000 lbs. of cotton, spun into yarns. About 85 hands are employed under the superintendence of Wm. Ridgeway. This establishment was built on the site of the old Carrick mill, and went into operation in the early part of 1858. It is a massive brick building, about 175 feet long, three stories high, and fitted up in the best manner.

Danforth, Cooke & Co. employ 65 hands and run 2,600 spindles, consuming 7,000 lbs. of cotton weekly, made into yarns. Their factory has recently undergone a considerable enlargement.

The Jefferson mill, owned by Jacob Rogers, contains 3,400 spindles and employs 70 hands. Weekly consumption of cotton, about 6,000 lbs. A. Polhamus is superintendent.

The Union works (Thos. D. Hoxsey's) contain about 3,000 spindles, and consume 7,000 lbs. of cotton per week, made into twine, wicks, warps, &c. Number of employees, 60.

The Boudinot mill was built in 1857 by E. B. Atterbury, its proprietor and manager. This is the only cotton factory in Paterson driven by steam power, an experiment in which Mr. Atterbury appears to have been quite successful. About 40 operatives are employed and 1,500 spindles run, making yarn and twist. Weekly consumption of cotton, about 4,000 lbs.

A Mr. Crabtree is also starting some cotton machinery in an apartment of the Hamilton mill.

The aggregate number of cotton spindles running in Paterson may be set down at 48,000, while that of the employees reach to about 1,200. The wages paid to each of these will average $3.50 per week, or $225,000 per annum. The quantity of cotton consumed annually approaches six million pounds, from which, if 15 per cent be deducted for waste, we have a total of five million pounds of yarn spun and a million and a half yards of duck, Canton flannels, &c., woven. To attempt making an estimate of net profits would be futile, as probably no two establishments show a like result.

Among the more prominent early manufacturers of cotton, besides those already named, may be mentioned Daniel Ridgeway, Mark W. Collet, Wm. Jacobs, Rutan & Benson, Jackson & Magennis, and Robert Carrick. Mr. Ridgeway for many years carried on the business in the Industry mill, in partnership with Wm. Dickey, the oldest native of Paterson. Mr. Collet occupied what is now the Oakman mill, and Mr. Jacobs the Jefferson mill. Mr. Carrick was engaged from 1823 to 1848, including the disastrous era of 1837-8, spinning and weaving. His mill was burned down by an incendiary in 1848, when Mr. Carrick retired to private life, to the general regret and loss.

By the introduction of power looms hand-loom weaving was for a long time driven to the wall. About the year 1838, however, it was revived by John Parker, who manufactured towels, table covers, &c. Subsequently, Abm. Croysdale, Allan Knowles, and others, embarked in the same business, and at present about 60 looms are at work for some half a dozen parties in town. Among these Wm. S. Malcolm has distinguished himself by the production of new and superior fabrics, such as woolen and cotton quilts, counterpanes, wool damask covers, hoop extension tapes, and the like. Mr. Malcolm began in 1848, and in 1853 received the only premium given at the New York World's Fair for such goods. He also received a premium at the Castle Garden Exhibition in 1854. From 20 to 25 looms are at work for Mr. Malcolm, and his fabrics command an extensive sale over the country.

Under the head of cotton manufactures may be mentioned the napping of Canton flannel, carried on in the Beaver mill by George Wylie, who runs 28 of these machines, with which he is prepared to turn out 30,000 yards per day. His work is all done to order.

It seems to be difficult, if not impossible, to naturalize the manufacture of both cotton and wool in one place, and Paterson affords no exception to the rule. As early as 1813 wool spinning was commenced on a small scale in the Nightengale mill, by John Tice, agent for a New York firm. The fabrics made were coarse, and woven on hand looms in private houses. The parties afterwards purchased the Beaver mill, falling in with the current of that day, which drifted towards the cotton interest. Mr. Tice subsequently prosecuted the business in a small mill near the Little Falls. The Holseman mill was built for the woolen manufacture by two Frenchmen; also the Mallory mill by John Traverse, and Harmony by a Mr. Berry. All these followed the example of the Beaver. Cotton was king. The only other attempt made was by Benjamin Bailey, who started to spin carpet yarns in 1846, and now runs a few cards in making these.

Morrow's mill, situated half a mile east of Paterson, has proved successful in the woolen business. This was built in 1810, as a cotton factory, by Wm. Rawson, from whom it passed into the hands of the late John Morrow in 1824. Mr. Morrow turned it into a woolen mill, and since then it has been rebuilt and greatly enlarged, until it gives employment to 50 persons, who manufacture printers' blankets, paper-makers' felts, and the like. C. W. L. F. Morrow & Co., of New York, are the proprietors; John Marsden is superintendent.

The Anglo-American mill at Haledon (formerly Brundred's) was purchased by Messrs. Hodges, agents, in the Fall of 1857. After expending large sums in resurrecting the place, operations were commenced in the following summer. They now employ between 300 and 400 hands (half of them inside the works), and carry on an extensive business in making hosiery and stockinett cloth for linings to india-rubber goods. The merinos made at these works are a beautiful fabric, composed of wool and cotton. Most of the yarns required are spun on the premises; there being 2,000 cotton and 1,000 wool spindles at work, the whole producing 1,200 lbs. of merino yarn per week, besides which considerable purchases of yarn require to be made from other quarters. This is woven on French and Belgian machinery into heavy cloths for coats, glove cloth, shirts, drawers, stockings and counterpanes (plain or fancy). The proprietors are now making arrangements to turn out 5,000 pair of stockings per week. Independent of these the Messrs. Hodges have done much to improve the neighborhood. Their works are situated about two miles from the center of Paterson.

Carpet-weaving has for many years been successfully carried on by Robert Beatie, at the Little Falls. Mr. Beatie has lately completed a most substantial and handsome factory which he is filling with power looms and other machinery, in addition to his factories previously in operation. His three-ply carpet is pronounced equal to anything in that line ever produced.

[To be continued.]

ABORTION IN COWS FROM ERGOT

Abortion in cows arises from so many causes, and many of them so occult, that it is scarcely possible to provide against it. That it spreads, when once established, is attributable to sympathy, which has long been admitted, and this sympathy is most probably stimulated through a delicate smell acting on an excitable imagination; "for it has been stated," says Youatt, "that a cow is an animal considerably imaginative, and highly irritable, during the period of pregnancy." The guarding against this is evidently the immediate separation of the affected animal, the purifying and cleansing of the house, accompanied, of course, by thorough and perfect ventilation. But there are may pre-disposing causes of abortion, the mention of which may sufficiently point out the most efficient ways of avoidance. One of these causes, not in general, however, to be apprehended in Ireland, is high-feeding. Cows, when in an extravagantly high condition, are in continual excitement, and constantly liable to inflamation in the uterus, and consequent abortion. A second cause has been found to arise from feeding with bad hay. A third has been observed to occur in the autumn-grazing of cows upon fields thickly covered with hoar-frost, or, indeed, on any pasture which has a tendancy to produce inflammatory disorders. A fourth cause is grazing upon pastures containing acrid plants, or upon the coarse, rank herbage of low, marshy, and woody grounds. A fifth cause is the drinking of stagnant or putrescent water. A sixth cause, the drinking of water impregnated with iron. A seventh, the feeding on hard, unsucculent food, as straw, &c., thus occasioning cows to drink large quantities of water, injury from fatigue, or from blows, and the prevalence of any bad odor, probably of a vegetable nature. But a very certain cause, which has hitherto received but little attention, is noticed in the leading article of the *Agricultural Gazette* of Sept. 24th, in ergot, the existence of which has been little suspected in the seeds of grasses of pastures which have been grazed through the summer, in which the stock having avoided the seed stems, these have been enabled to fulfill their special functions and produce seed, which, subsequently became diseased; and it remarks, "It is clear that if prevention is the object to be aimed at, this will be best attained by keeping breeding stock from land thus bearing a diseased produce; removing the breeding cows and heifers, say in July, and keeping them afterwards upon land which had been mown that season. There are very many districts where the climate, from being dry, does not render this precaution necessary; but, at the same time, there are numerous tracts of land where the moisture of the climate acts upon the grass seeds and favors the growth of ergotized grass." Ergot appears to occur most frequently on stiff, wet, undrained land. Ergot is well known to effect, powerfully, uterine action, for it has been much used beneficially in cases of difficult parturition in the mare, the cow, and the sheep; but it ought only to be employed by cautious and skillful practitioners, and it ought never to be administered even by these, and especially with the cow, except in cases of extremity.—*Irish Agricultural Review.*

WHITE LEAD IN PHILADELPHIA.

We copy the following instructive information from our cotemporary, the *United States Gazette.*—Among the numerous manufactures in which Philadelphia has attained conceded pre-eminence, is that of chemicals and white lead, in which so important a part is performed by the firm of Wetherill & Brother, Second-street, near Arch. The history of this firm is replete with interest, shows that when a man brushes back his hair and buckles down to business, there is no assigning any limit to his achievements. The business now carried on by Messrs. Wetherill & Brother has been carried on from generation to generation, through a long succession. It was founded by Samuel Wetherill & Son, who for many years were extensive importers of paints and chemicals, but who became open to the conviction that a vast deal of unnecessary importation was then done. They set at work, therefore, in the belief that American skill was as potent as foreign skill, and that most of the articles which they then imported could be made at home. The firm was composed of patriots. The senior aided his country in the war of independence, for which resistance he was discarded by the Society of Friends. The Free Quakers, however, received him with open arms, and, as their preacher, he often officiated at the meeting-house which still stands at the corner of Fifth-street and Arch.

When Water-street in accordance with the will of Stephen Girard, was widened, and the old store was taken down, the firm removed to No. 33 North Front-street. The warehouses and mill of the old house were in Combs' alley, in the rear of Second-street; and the very first stationary steam-engine ever used in the United States was employed by them in grinding paints. The present firm ultimately obtained the lots Nos. 47 and 49 North Second-street, upon which stood two old stores, and upon this they reared the present splendid business edifice which they now occupy.

Their works are at West Philadelphia, where they have built a huge structure that looks like a cross between the Eastern Penitentiary and the monastery of St. Bernard on the slope of the Alps. Here they produce white lead of a character whose excellence is recognized in every quarter of the Union. The present works in West Philadelphia were built on an enlarged and improved plan by the late John Price Wetherill and Dr. Wm. Wetherill. The works produce from pig lead about 1,600 tuns annually, and also yield large quantities of litharge and red lead. Besides this, they produce nitric and muriatic acid, ether, both nitrous and sulphuric, the various preparations of mercury, alcohol and burning-fluids, together with many other chemical preparations, beside refining camphor and niter.

AN AMERICAN ROUTE TO CHINA AND JAPAN.—The schooners *Lewis Perry* and *San Diego*, from Petropaulovski, lately arrived at San Francisco, the one having made the passage in 23 days, and the other in 24, from Japan. Had these vessels connected with the regular mail steamers, we should have had news from Japan in 43 days—as fast as it comes by the European route. But suppose the communication between Hakodadi and San Francisco was direct, and by a line of steamers connecting with the Atlantic ports, or, as it may be, at no distant day, with the trains of the Pacific Railroad, would not all our news and most of our light trade go and come by that route? It is fair to presume that it would.

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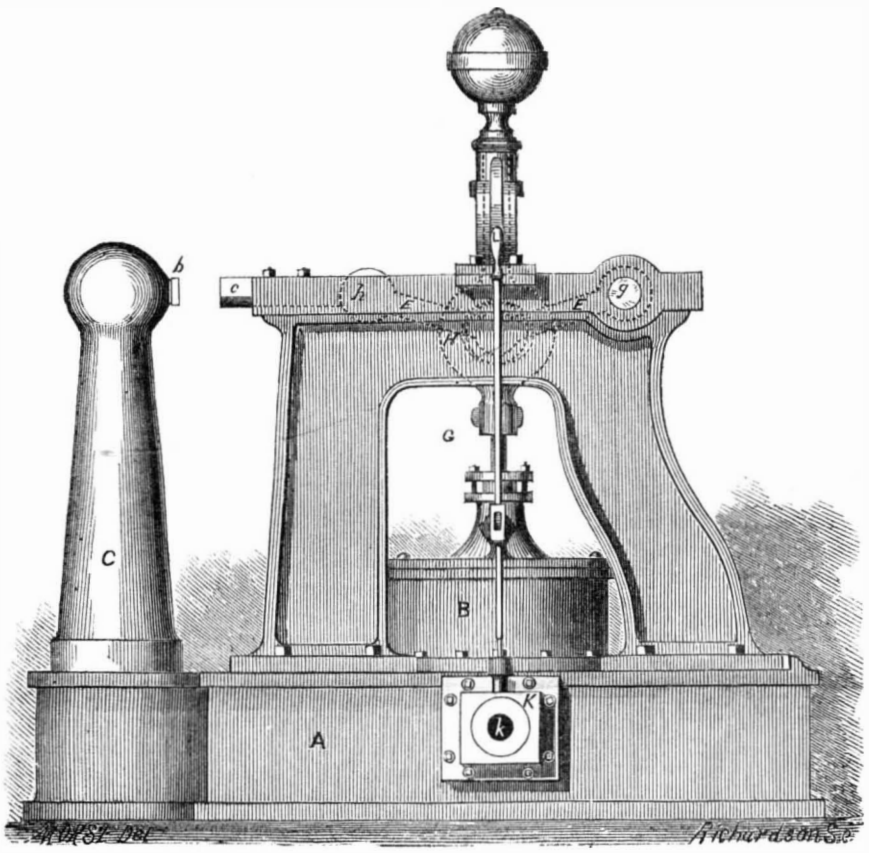
IMPROVED STEAM RIVETING-MACHINE.

It is doubtful if the labor which is now done in hammering, planing, turning, cutting, punching, and riveting iron, by steam and water power, could be performed by the efforts of all the inhabitants of the country if their whole labor were directed into this channel. The properties of the metals adapt them peculiarly to be operated upon by machinery. They are so rigid that they can be handled by machinery with great precision, while their hardness demands the aid of the great forces of nature in cutting and shaping them. Numerous machines have consequently been invented for working iron and other metals, and no doubt new ones will continue to be invented for hundreds of years to come, for "perfection" has not yet been written upon any of the works of man. One step in this long series of improvements is illustrated in the accompanying engraving.



SPARROW'S STEAM RIVETING-MACHINE.

It is a machine for riveting bolts, and for punching and cutting iron, and consists simply of a toggle press acted upon directly by the piston of a steam-cylinder. The rivet to be headed is placed between the die, *b*, and the horizontal slide, *c*. The steam-cylinder, B, is open at the upper end, the steam entering through the pipe, *k*, and steam-chest, K, and acting on the under side only of the piston. The cross-head, H, of the piston-rod, G, has an elliptical opening or slot through which, in a friction-roller, passes the pin which connects the toggle with the piston-rod. The two arms, E E, of the toggle are forked, one to receive the piston-head, and the other embracing both the piston-head and its fellow toggle. Fastened rigidly to the piston-head is a rod extending in an exact line with the piston-rod upward into a vertical guide, to retain the piston in its true line of motion. L, is the lever for opening and closing the valve.

The principal advantages claimed for this machine are:—First, that it requires a comparatively small cylinder; second, the pressure can be regulated at will and retained upon the rivet until the rivet is well set; third, it is portable and, with the addition of a small boiler, may be set apart from any connection with the power or boilers of an establishment; fourth, steam is only required to do the work, acting on only one side of the piston, the weight of the piston bringing back the parts to their places.

The patent was issued (through the Scientific American Patent Agency) Sept. 27, 1859, and inquiries for further information may be addressed to the inventor, John Sparrow, superintendent of the Portland Company's Locomotive Works, Portland, Maine.

COAL OIL.—SECRET INVENTIONS.

The manufacture of coal oil has become a vast business, and millions of gallons are annually made and sold. As far as we can judge from observation, the article ordinarily sold in this city is well prepared for the market, but complaints continue to come to us from the country that a mere stuff, an imposition called coal oil, is palmed off upon them. There are a few manufacturers who give great attention to the purification of the article before it is offered to the market—they are secretly practising useful inventions for the purpose, while others seem to be satisfied to get the crude oil, and make the most they can out of it. Unless more care is taken in this particular, the oil will fall into discredit and disuse.

There are processes now secretly employed for the purpose of purifying oil, but they benefit the public comparatively very little, and there remains yet much to be done. A process used secretly does not prevent anothe party from legally patenting and holding the same thing, as the law does not contemplate that the secret use shall act as a bar to the rights of an inventor who secures a patent for the same thing. Judge Mason, while Commissioner of Patents, decided a case between two interfering applications that "When an invention is only resurrected to supplant and strangle an invention which has been given to the public, and which has been made practically useful, all reasonable presumption should be in favor of the inventor who has been the means of conferring the real benefit upon the world." If a certain process for purifying coal oil is in secret use in a coal oil factory, and a patent is afterwards granted to another party for the same process, it is the presumption of law that the patent is valid; and furthermore if it could be shown to the satisfaction of a court of competent jurisdiction, that the process thus secretly used was an infringement upon the one patented, the party infringing would be liable to damages for continuing its use, as against the rights and interests of the patentee, for neither the law nor the public know anything about inventions used secretly. It is not the purpose of the law to grant patents solely for the benefit of the inventor; it contemplates also the public interest, and the Commissioner is bound in the exercise of his functions to hold those two interests continually in view. A great field is open to inventors to discover some enconomical process for purifying coal oil, and whoever enter upon such investigations will do well to make careful records of their experiments so that they will be able to identify and prove their inventions in case a dispute should arise in future touching the question of priority of discovery.

MACHINES FOR SWEEPING STREETS.

It is now many years since we first directed public attention to machines for sweeping our streets, and though no movement was made for some years afterwards, to carry out our suggestions, the good seed thrown broadcast into the public mind has germinated and brought forth its golden harvest at last. Such machines are now employed, for keeping our streets clean, by R. A. Smith, who has undertaken to do the work for one half the amount formerly expended. They have now been at work for some time in Broadway and some other streets, and never before have we had such clean thoroughfares. The people are delighted with the change, and the store-keepers are in extacies. Our city, once famous for dirty streets, promises, under the new order of things, to become the cleanest-swept in the world. If all the streets were laid with the small block pavement, and machines employed as scavengers, we have no doubt that New York would become a model of cleanliness in her streets. Every effort should be exerted to bring about this result, for sanitary reasons. The greatest amount of mortality is always found to prevail in localities where the streets are left filthy, and the health of New York has been much lower than any city in our Union on this account. No city in the world is better situated for complete drainage and the means of public cleanliness, yet we have been disgraced for the prevalence of dirt even in our most frequented and fashionable streets. We hope these things have gone past forever. The street-sweeping machines were long opposed by many interested parties, but their recent success has conquered opposition, and it will not be easy for those political schemers who fattened on corporation dirt to brush them aside for any selfish purposes.

CLOSING OF THE AMERICAN INSTITUTE FAIR.—The Fair of the American Institute has closed and the prizes have been awarded, but up to the time of going to press we have been unable to procure a corrected list for publication. We wonder if this old respectable association will ever have instilled into it a moiety of the enterprise which characterizes the majority of the exhibitors which bring their wares and machines to the grounds every year for exhibition. At the time of our going to press, the awards have been made six days, and the managers cannot furnish a correct list for publication yet. If the Rip Van Winkles of the institute wake up in time, we shall publish a list of the premiums in our next number.

A CHANGE.—Captain Meigs, of the corps of Topographical Engineers, has been relieved from the superintendence of the capitol and Post-office extensions, and Captain Franklin, of the above corps, has been assigned to the charge of those works. He has recently served as Secretary of the Light-house Board, and is considered an able officer. An old feud has existed between Capt. Meigs and Mr. Walter, the architect, and the upshot of the matter is that the former has been removed from the post of superintendent.

GAS-WORKS AT THE ST. DENIS HOTEL.—Our readers will remember that we published an illustration of these works on page 113 of the present volume. We are informed that many persons have, in consequence, addressed inquiries in regard to the matter to the hotel; and we are requested to say that such inquiries should all be addressed to the "Gas Generating Company," No. 512 Broadway, New York.

HYATT'S application for the extension of his patent on illuminated vault-covers, referred to in our Washington letter, has been granted by the Commissioner of Patents. We shall endeavor to present an outline of this case in our next issue, as it involves some important considerations.

THE ST. LOUIS FAIR.—An interesting letter on the mechanical portion of the late St. Louis fair appears in this number, written especially for our columns. It should have been published three weeks ago; but owing to a press of other matter, it was crowded out. It will, however, be read with interest.

VINEYARDS ON THE OHIO RIVER.—A correspondent of the Cincinnati *Gazette* states that extensive vineyards have been planted on the Ohio river, in Kentucky, and that the produce of wine this season from them will reach about 300,000 gallons. The average is about 250 gallons per acre, but some old vineyards yield 400 gallons to the acre.

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NOTES ON THE GREAT ST. LOUIS FAIR.

[Special correspondence of the Scientific American.]

ST. LOUIS, Oct. 5, 1859.

MESSRS. EDITORS:—On my way to the fair grounds on Saturday, I was enabled to see the new steam plow of Robert L. Steen, and to ride upon it a considerable distance over the cobble-stone pavement of this city. With a view to exhibiting its capacities for traveling over roads, Mr. Steen had fired it up, and brought it through the public streets to the Planter's Hotel, where it was blowing-off as I came up. A crowd (about as large as would be attracted by a fourth-rate dog-fight) surrounded it; and, in a small way, the poor inventor was pestered with questions of more or less pertinence. I stood by for awhile, listening, and gathered from the engineer that there was a popular suspicion that the self-moving steam-carriage was a cross between a railroad lumber-truck, a threshing-machine, and a patent corn-mill. Long, lank specimens of humanity, some of them clad in rusty homespun, and carrying their trusty rifles, would elbow through the crowd, plant themselves with legs apart and mouth open, and deliberately survey the machine "from turret to foundation stone;" and then walk away without a word. But the strangest spectators were some real wild Indians, who were going somewhere, I presume, on some sort of business. They were four in number, and clad in fringed dresses, and robed in blood-red blankets; and as, from a window of the hotel, they gazed upon the great invention of the nineteenth censury, without an emotion visible on their paint-streaked, coppery faces, they suggested a striking contrast between the intellectual darkness of savage life and the splendid achievements of civilization.

It is only a year or so since our pressing national need for a steam plow was recognized in the offer of a large premium for a successful one; and yet there are already eight, wholly or in part, ready for public exhibition. Besides Fawkes' (with whose machine our readers are already familiar), there are those of Hussey, of Baltimore; of Mann, of Troy; Field, of Seneca Falls; Waters, of Detroit; Gould, of Hartford; Van Doren & Glover, of Chicago; and Steen, whose fiery chariot is on exhibition before us. So fertile is American genius! And if, in two years, we can invent seven steam plows without precedent to guide us as we grope, what will be the score at the end of twenty? Once in awhile we may see them springing successfully from subtile brains, as has Fawkes'; but before we get the machine that will fill the great hiatus, many a wreck must be seen along the way, and many a poor inventor to bring out his crude conceptions will beggar beggar himself and family.

This machine of Steen's, I do not think as good as that of Fawkes. I will describe it, and you will see why. There are two driving-wheels 8 feet in diameter, with wooden spokes and hubs, and iron-faced adjustable felloes, so arranged that the ordinary 6-inch tires used when running on hard roads may be replaced by others 20 inches broad for stubble-ground travel. There are two 3½-foot wooden guide-wheels in front, which are steered by means of a lever-purchase with a wheel and chain, worked by a 4-foot steering-wheel. There is a platform 6 feet wide by 17 feet 4 inches, to outsides; to outsides of wheels, it is 8 feet 2 inches. The upright locomotive boiler, 8 feet 5 inches high, by 45 inches diameter, contains 127 1¾-inch tubes 3 feet long, and has a 2-inch water-space. The fire-box is circular, and 41 inches in diameter; the smoke-stack is 3 feet high, and 16 inches diameter at the throat. It has an internal hood to throw back sparks through flues to the top of the boiler, where they are consumed. There are two cylinders, 5 inches diameter, 10-inch stroke, and geared 9 to one of the drivers, to which motion is given by means of spur gear on the inner face of the spokes. The boiler is set just in front of the main axle, on a wrought-iron plate secured to the frame; and the water-tank, which has a capacity or 8 barrels, is just behind the axle; while the coal or wood is carried on the floor. as on an engine-tender. The inventor says that when ascending steep grades, he will increase her tractive power by shifting the fuel forward.

The plowing application is not yet arranged. All that he has had time to do, since he took up the invention in July of this year, is to get his tractive power. But his plan of plow arrangement is thus: he will not have one general rhomboidal frame over all his plows, as Fawkes' has; but in its place a simple guide-board, notched to take in each beam in regular order, which which will prevent any lateral displacements. Each plow is to be drawn from the main axle, and the rear end of the platform, by a separate chain attached to staples. Thus, he thinks, each plow that might strike an obstruction would be free to part company from its neighbors, and the right hand really not know what the left hand doeth. A cross-shaft, with suitable pulleys, furnishes the means of applying the power of the engine to stationary machinery.

As I see them on a first examination, Mr. Steen's engine presents these objectionable features: the connection between engine and drivers is not good, for there is too much intermediate gear. The spur-gear on the spokes of the drivers are exposed not only to what dirt would arise from a dusty road or field, but to all that which drops from above at each rotation; and it needs no prophet to see that before long the gear would be cut so as to be useless. The wooden wheels are entirely too weak. The engine is attached to the boiler; but the gearing rests upon the timbers of the frame, and the rapid motion of the piston will jar and rack the frame and gearing, so as to throw the latter out of line. The boiler has a greater diameter than Fawkes', and but half the fire-surface; while, so far as durability, ease of management and tractive power are concerned, this machine is far from being what it might be made.

Entering the Mechanics' Hall, we are struck with the clumsy appearance of the line of wooden shafting. Surely, with so abundant pecuniary resources, this society could well afford to replace it with a line of that beautiful shafting which Sellers turns out from his shop. The space allotted to machinery is meager, comparatively; and some of the surplus funds should be at once appropriated to the enlargement of this most important department.

The first valuable machine that we notice is the simple and effective "Power Flax and Hemp-breaker," of Mann & Walker. Its capacity is said to be as much as 1,500 lbs. per diem, and its work is done in a thorough manner. The blades of the brakes are 4 feet long. In the top one, there are three blades, in the lower four. The top brake is hung on a shaft, and has an iron plate projecting behind, so that it may be worked like a trip-hammer, by an eccentric. The tappets of the eccentric are 9 inches apart, and are said to give 120 strokes per minute. You will perceive that the simplicity of its construction is such that it may be safely entrusted to ignorant plantation hands.

Ellithorpe & Scoville have their "Stone-breaker" at work on quartz and iron ore, and are demonstrating its capabilities in a thorough manner. Of the nature of this machine many of your readers are familiar; but for the instruction of the thousands who have recently subscribed, I would say that the whole process consists in feeding pieces of rock from an iron hopper between two heavy-toothed rollers, which, being adjusted to any required distance apart, crush the rock to a given size, and pour it into a shute conducting to a suitable delivery-table.

A gentleman of St. Louis offered, last year, a prize of $100 for the best fire-escape, to rescue persons from burning buildings. In response to this call no less than seven models were offered. This year there was but one on exhibition: it consists of a series of ladders which may be raised to any desired hight. The lower one is attached to an axle and wheel carriage, and the others are raised by cords and pulleys. The persons to be saved are placed in pockets attached at regular intervals to an endless canvas belt, which passes over a sharp-grooved wooden roller at top and bottom. The speed of the descent is controlled by a crank attached to the lower roller.

The show of agricultural implements at these western fairs is always large, for here is the great field for their usefulness. The West is peculiarly an agricultural district, and it is for western farmers, more than for others, that the ingenuity of American mechanics is taxed. There are on exhibition at this place between 20 and 30 reapers and mowers; the number including nearly all the established favorites, and some yet untried. It is in plows, however, that we see the great show. John Deere, of Moline, Ill.; Buford, Tate & Co., of Rock Island; Andrus Brothers, of Grand Detour; and T. D. Brewster, of Peru, Ill., are the leading plow-makers of the West, and such collections of highly-finished plows as they exhibit at fairs I never saw in any country. If either lot were shown at an English fair it would attract a dense crowd from morning until night.

Kinman's measuring-faucet is a peculiarly ingenious little apparatus for drawing, in the coldest weather, from a barrel, any given quantity of molasses or other heavy liquid. As you will probably illustrate it in your superior style, it will not be worth while to occupy space at this time.

The black soil of the prairie is, to a considerable extent, underlaid by a tenacious clay, and unless this is broken through, so that surplus rain water can pass down, there are formed sloughs which are too soft to plow, and yet do not often furnish a body of good water for stock. This state of things calls for a mole plow, capable of making tubular drains in the sticky subsoil, for the drainage of the land. Of these useful implements there are several exhibited. That of A. Hammond has a sole or "mole" differing in shape from the others, and, I think, superior. Alongside the cutter, where it is attached to the sole, are grooves, one on each side, and behind the cutter the sole rises and recedes rather abruptly until it ends in a sort of rounded point. It is claimed that the clay passing through the grooves and forced upward and together by the rear of the sole, forms itself into a good pipe with a closed top arch, and thus greater durability for the drain is secured. A fin cutter is attached to the bottom of the sole is said to leave a gash in the ground, which materially increases the filtration of water into the pipe. The inventor says that with two men and two yoke of cattle to work the windlass, it will make 100 rods of ditch, 3½ feet deep, a day. Of the permanency of this ditch in proper subsoil there is no question. I have been told by farmers in Illinois that they have them in perfect working order after being used for six years.

The corn-planters are in number like the locusts of Egypt. Here we have machines to plant in hills and in drills, and even broadcast; to plant one row, two rows, three rows, four rows, at a time; and to plant at any depth desired. One of the simplest and best is Brown's, which is capable of planting perhaps 15 to 20 acres a day. There is a frame with two bob sled runners, that are sharpened in front and flare open behind. The corn is in a hopper over each runner, and a cross-bar, made to slide to and fro laterally by a lever, passes into each hopper and cuts off the corn from dropping through the tube, or leaves the hole open, as desired. The seed falls just behind the sled runners, is covered by the flange, and the ground is compacted by a small roller that comes after. A man drives the horses and a boy works the lever.

I notice several modifications of this principle, some of them clearly infringements. Some one has made the following computation of the relative cost of planting corn by a machine, by hand, covering with a plow and by hand, covering with hoes. While the figures are no doubt excessive, they are not without interest.

First, with the machine, it will take 2 hands and 2 horses one day ($3.00), plant from 15 to 20 acres.

To plant the same number of acres, covering with plow, will take—

2 hands, 2 plows, and 2 horses, to check off	$3.00
2 hands to drop	2.00
2 hands, 2 plows, and 2 horses to cover corn	3.00
Board of 4 extra hands	1.00
Cost covering with plow	$9.00
Cost of planting with machine	3.00
Difference in favor of machine	$6.00

To plant the same number of acres covering with the hoe, will take—

2 hands, 2 horses and plows to check	$3.00
2 hands to drop	2.00
6 hands to cover	6.00
Board for 8 extra hands	2.00
Cost covering with hoe	$13.00
Cost covering with machine	3.00
Difference in favor of machine	$10.00

This greatest of agricultural shows is now about to close. The receipts from all sources have been about $38,000, and it is estimated that as many as 40,000 persons were on the grounds in a single day. Throughout there has been little disturbance, but I regret to say that I have seen more intoxicated men here than in any other two shows I have attended. There are beneath the great amphitheater 81 small booths, all of which are rented for the sale of liquors, beer and refreshments. The gross income to the society from this source is nearly $10,000, the booths being put up at auction and knocked down to the highest bidder; It is a disgrace to an agricultural association to suffer such a state of things to exist, and its only excuse must be that the peculiar customs of border civilization make tolerable what we, at the East, would never countenance.

HELIX.

[Kinsman's measuring-faucet, referred to by our correspondent, was illustrated and described on page 272, present volume of the SCIENTIFIC AMERICAN.—EDS.

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NOTES ON FOREIGN INVENTIONS.

Pneumatic Fire Detector.—Messrs. Taylor & Grimshaw, of London, have patented an ingenious fire-alarm and indicator. It consists of a small cylinder of thin metal, to contain atmospheric air. Within is a flexible diaphragm made perfectly air-tight. The expansion or contraction of the air in the cylinder causes the center of the diaphragm to rise or fall in a vertical line, and so give motion to a piston-rod transmitting motion through screw-gearing to a pointer which marks the temperature on a dial plate. By a simple arrangement, when the pointer reaches any arranged position, an alarm bell is rung. If placed in a ship's hold, and the temperature should be raised by spontaneous combustion, or otherwise, the excess of heat is shown on a dial on deck, and proper measures may be resorted to; or it will regulate any form of ventilator.

Railroad Conductors' Watches.—The conductors on the Swiss, French and Italian railroads carry a watch of ingenious construction, designed to lessen the danger of accidents. The aperture by which the watch is wound up is accessible to the conductor, but that by which the hands are regulated can be opened only by an official whose business it is to set all the watches by a common standard. Thus the time of running of the trains is rendered uniform, and no accident is excused on the ground of mistake. The aperture by which the dial is regulated is closed by an application of a system of permutations, such as is employed in some permutating locks.

Armstrong Guns and Iron Batteries.—Some experiments have lately been made at Shoeburyness with Armstrong rifled cannon, firing into a floating steam battery, called the *Trusty*, which is simply a steamer covered with thick iron plates. The result of the experiments are to the effect that iron plates, of no less than four inches in thickness, are no proof against the solid shot from such guns. Every shot that was fired shivered the plate to pieces, and entered the vessel. Some of the shots passed entirely through the vessel, going in at one side and out at the other. This class of vessels, it seems, are entirely useless for resisting shot from such guns.

A Steam Elephant.—A locomotive for common roads, called "Taylor's Patent Steam Elephant" has been lately brought out and tried in England, with some success. In appearance it resembles Fawkes' steam plow, recently illustrated in our columns, with the plow frame removed. It weighs seven tuns; and the driving-wheels make but 14 revolutions while the engines are making 280. It is therefore geared down in the same manner exactly as Fawkes', but instead of one large bearing-roller supporting the whole machinery, it has two large flat wheels, six feet in diameter each. It is chiefly intended for drawing heavy loads as a substitute for animal power, and for this purpose it has been quite successful—so it is stated.

Submarine Telegraph Cables.— M. Harder, the distinguished English electrician, has lately obtained a patent for a submarine cable constructed as follows:— The wire strand is about five times larger than that of the Atlantic cable; this is first coated with a number of strands of flax twine laid on a long spiral, the reverse of the twist of the wire. Over this a coat of gutta-percha is laid, then another layer of twine is laid in an opposite direction to the first, and the whole then covered with two layers of gutta-percha. No outside shield of iron wire, as in the Atlantic cable, is employed, but simply twine and gutta-percha as the coating of the conductor strands. Every strand of the twine possesses a breaking strength of 40 lbs., therefore great strength is combined with lightness, and this is certainly an advantage.

Triple Steam-engines.—J. Howden and A. Morton, of Glasgow, have obtained a patent for a peculiar combination and arrangement of high-pressure and expanding engine cylinders. Three cylinders are used; one receives the steam direct from the boiler, the other two receive the steam alternately from the first. These three cylinders are so connected to the crank-shaft that their respective strokes commence at periods about one third of the revolution. They may be placed in a line above, below, or at one side of the shaft, their pistons being connected to separate cranks, or they may be placed so that their pistons shall be connected to the common or to the Z-crank. The piston of the first high-pressure cylinder has an equal effective area on both sides, but the pistons of the low-pressure cylinders have unequal effective areas on opposite sides. The high-pressure cylinder receives steam direct from the boiler during a part of the stroke, and the steam then finds egress through a port and enters the end of one of the other cylinders and expands, then escapes into the condenser. The steam which has entered the other end of the high-pressure cylinder and performed the other stroke, now escapes into the third expanding-cylinder and actuates the piston in it, and so on alternately. The object of this arrangement is to obtain the benefits of high pressure and expansion of the steam to a more full extent than in common engines, and at the same time secure a more uniform rotative motion of the shaft.

Propelling Vessels.—A patent has been obtained by W. Middleship, of London, for propelling vessels by a rather singular device. The screw is made hollow and open at the center, so that the interior space may communicate with the interior of the hollow shaft upon which the screw is mounted. Water is admitted to the hollow shaft and allowed to flow to the end of the hollow screw blades where it is discharged obliquely through orifices, and the reactionary force of the effluent water rushing from these openings causes the screw to rotate upon the principle of the turbine wheel.

EXTRACTING SILVER FROM ITS ORES.

The processes now in use at the reduction works of the Sonora Exploring and Mining Company, for the extraction of silver from the ores, are essentially three, viz.: smelting, amalgamation in barrels, and amalgamation in the open air, or the *patio* process. They are briefly described by Mr. Frederick Brunckow, who has recently returned from Arizona, in a report to a committee of the stockholders, from which the following is in part extracted:—

The ores of the Heintzelman vein, as well as most of the Mexican ores, contain a considerable portion of quartz, which renders them difficult to smelt. The richest portions only are therefore selected for the smelt-process.

The lower part of the furnace is built of a fine-grained refractory quartzose sandstone found in the neighborhood. The upper part and the smelting-house are built of brick, dried in the sun and air, called *adobes*. The smelting-chamber inside the furnace is twelve inches square, and the blast is produced by a double bellows constructed at the place and worked by one man.

To each part of selected silver ore, three parts of lead ore from the Arenilla mines are added, and after complete fusion the contents of the chamber are allowed to run off into a basin on the outside. As it cools, a crust is formed on the surface, which contains to a large extent sulphurets of copper, lead, and the impurities. This is taken from the lead below and kept separate. The lead is run into castings in the form of cakes, ten inches in diameter, weighing 75 pounds. Six of these lead cakes are put on edge, one near the other, upon two inclined iron plates, which nearly touch each other. Charcoal is placed around and between the cakes, so that they are enveloped, and after kindling it the lead cakes must be protected from draughts of air. The heated cakes commence to melt and sink, and the lead runs down the iron plates to a basin, from which it is run into pigs. This lead is free from copper, and yields about 40 pounds of silver to the tun. A skeleton of each lead cake is left behind on the iron plates, and is rich in copper, and yields some silver. In order to separate this from the copper, the skeleton is broken into fragments and passed the furnace in company with the crusts taken from the lead in the first place, and with some other lead ore. By smelting the skeletons and crusts, which contain sulphurets, &c., lead will result, which is put in castings in the form of cakes; these cakes are put again upon the inclining plates, and pass through the process described before. The remaining skeletons this time contain very little silver; they are smelted in a copper refining reverberatory furnace and refined, and in the form of balls of metallic copper are delivered over to the amalgamation works, where they are required for the barrel process.

The argentiferous lead, free from copper, is put in a cupellation furnace, and passes the well-known exydating process; the silver remains, and is refined. The resulting oxyd of lead is added to the lead and silver ore, and again passes the blast furnace.

To prepare the ore for amalgamating in barrels, it is crushed by stamps, and passes three sieves. The siftings of the first sieve are put under the stamps again. The sifting of the second sieve is as fine as the grain of wheat, and the total sifting is delivered to the ore-mill, Arastra, where it is ground with water to a very fine powder; then it is dried and crushed. The sifting of the third sieve gives a powder fine as flour. This powder and the obtained fine-ore powder of the Arastra mill is mixed with 8 per cent common salt, put in a reverberatory roasting furnace, and roasted till all the metals are formed into chlorides; this process is completed in five hours. Eight hundred pounds of this powder are put into the amalgamation barrel, together with a certain quantity of water and 75 pounds of the copper balls from the smelting furnaces. The barrels are then made to revolve, so that the whole mass in the barrel will form, after a certain time, a paste so stiff that the 400 pounds of quicksilver now added will not remain in a separate mass at the bottom, but will be divided through the whole body of ground ore in minute globules, unseen by the naked eye. The barrels are now made to revolve for 22 hours. The formed chloride of silver will be precipitated into metallic silver by the presence of the metallic copper; chloride of copper will be formed, and this will be lost. The silver in the metallic state in contact with the quicksilver then forms the amalgam. The copper exists in the roasted mass as chloride of copper; it has no influence in the amalgamation process, and is lost in the residue. After 22 hours, more water is put in the barrels, in order to thin the paste, and to accumulate the minutest globules of quicksilver and the formed amalgam in a mass. This will be accomplished in two hours, by allowing the barrels to revolve slowly. The barrels are now opened, and the quicksilver and amalgam runs out in troughs, from whence it is put into strong canvas bags. The surplus quicksilver is pressed through the bags by its own weight; the remaining stiff amalgam is retorted; the silver, not being volatile, remains, and is melted, and cast into bars. The bars are marked with the company's stamps, numbered, their fineness according to the assay, and their value in dollars marked upon them.—*Mining Magazine.*

THE HAMMER."—GROSS PLAGIARISM.

In our last issue we presented an extract from a foreign periodical, in which it was stated that the whole of the "Pilgrim's Progress," the authorship of which is ascribed to the famous John Bunyan, was a gross plagiarism, having been copied entire from a rare old book, written by G. de Geideville, published by Caxton, in 1483. At present our opinion is against believing in the literary piracy of the sturdy converted tinker, but we have no means of proving or disproving the accusation. There is, however, a case of literary plagiarism which has just taken place nearer home, and which, although of minor importance, is as wrong in moral principle as if it were a thousand times of greater moment. The case to which we allude is an article entitled "The Hammer," published in the *North Western Prairie Farmer* (Chicago), of the 15th ult., with the signature of William H. Pearce, of Paw Paw, De Kalb county, Ill., attached to it. Excepting the first ten lines of the article in the columns of our cotemporary, the whole of it will be found on page 397, Vol. II., of the SCIENTIFIC AMERICAN, and was written by us more than 12 years ago. This article we have seen copied into other papers a hundred times since it was first published, some giving us credit, others not; some, again, giving credit to other parties. But never before has a single individual, so far as we know, but William H. Pearce, claimed its personal authorship. There is nothing more honorable than giving an author the credit which justly belongs to him; nothing more mean than to appropriate his productions, because this can be done with legal impunity. It is, however, a dangerous practice, as we have never known a case of this kind which was not ultimately found out, and the wrong exposed. We do not know Mr. Pearce, but have charity to believe that he has merely committed an oversight—that he sent the article to the *North Western Prairie Farmer* as suitable for its columns, and signed his name to it by mistake.

AMERICAN PLATINUM.—A new vein of platinum and gold has lately been found at Frederickstown, Mo., by Dr. Koch, of St. Louis. It is stated to be very rich.

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INFLUENCE OF DIFFERENT KINDS OF MANURE ON HERBAGE.

The grasses form a most important tribe of farm plants. Nutritious in their bulky green state, and highly conducive to the health of the stock which browse upon them in our pasture fields, they are no less valuable when dried into hay. The natural history of the grasses has long since been written; they are belonging to one great family of plants—the graminaceous—and possess certain characteristic properties by which we readily recognize them. The chemical and other properties of the grasses vary very considerably. One contains more albuminous compounds; another, more mineral ingredients; one is most nutritive at the period of flowering; another contains most nutritive matters when fully matured, It is, however, singular that we are not in possession of reliable data whereby to pronounce an opinion as to the relative merits of the grasses. Science has thrown some light upon this subject; it is but that dim glimmer which prevents our seeing the entire distance before us. There is a dark place which must be illumined, and an ignorance which must be corrected, ere the farmer and the grazier can truly balance the merits and demerits of particular grasses for particular purposes. Chemical analysis alone will not accomplish all that we require, any more than the empiric conjecture of the more practical man; the two must co-operate, and naturally correct and assist each other.

The grasses, like other plants, are amenable to those various physical agencies which influence vegetable life. Heat, air and light exercise their own distinctive functious in modifying the size, &c., of plants. That there is a most intimate connection, too, between the soil and the character of the vegetation which it naturally bears, is well known. It is also a well-known fact, that the manures with which we top-dress grass lands very considerably influence the character of the sward, diminishing the proportion of one species of grass, and increasing that of another. The laws by which these modifications were effected remained, unknown, however, until Messrs. Lawes and Gilbert undertook to investigate the subject. In experiments instituted to test the effects of different manures in simply increasing the valuable yield of grass, they were so struck with the marked effects of some of the manures in destroying certain plants and families of plants, that they sought the assistance of the late Professor Henfrey in classifying the plants composing the sward. The plots selected for botanical examination were:—

1. Not manured.
2. Manured with ammoniacal salts alone.
3. " mixed mineral manures alone.
4. " do. and ammoniacal salts.
5. " do. and double quantity of do.
6. " farm-yard manure.
7. " do. and ammoniacal salts.

The herbage was classified chiefly into (*a*) graminaceous plants, (*b*) leguminous plants, and (*c*) miscellaneous herbage, principally weeds.

The graminaceous plants formed, at the time of cutting, 75 per cent. of the produce of the unmanured portion; on the part manured with farm-yard manure, they found 87¾ per cent.; 79¾ per cent. when farm-yard manure and ammoniacal salts were used; 72 per cent. on the portion to which mineral manures were applied; 89 per cent. where 40 lbs. of ammoniacal salts alone were used; 79⅛ per cent. by the same amount of ammoniacal salts and mineral manure; and 97¼ per cent. where the double allowance of both ammoniacal salts and mineral manures were applied. The quality of the graminaceous herbage varies, no less than the proportion of it which composed the herbage under the different manures.

At one time the graminaceous portion of the herbage consisted of 66 per cent. of flowering or seeding stem, and 34 per cent. of leaf and undeveloped stem, on the unmanured plot; 59 per cent. of flowering and seeding stem by mineral manure alone; 40 per cent. of the same by ammoniacal salts only; 75 per cent. by the joint application of animal and mineral manures; 67 per cent. by double application of both manures; and 80 per cent. when farm-yard manure and ammoniacal salts were applied.

It has been found that the manures which increase the amount of whole produce also increase, in a very high degree, the proportion of graminaceous herbage, a conclusion which is of no less interest than importance. The foregoing facts also lead to another instructive conclusion, namely, that nitrogenous manures have a special effect in developing the "proportion of leaves and shoots," while mineral manures tend to the increase of the flowering and seeding of the plants; a conclusion of great practical value to the farmer, as it teaches that guano and sulphate of ammonia produce very different results from those mineral manures which depend for their efficacy on their containing the ash constituents of plants.—*Irish Agricultural Review.*

PENNSYLVANIA ROCK OIL.

In most countries, a troublesome process must be undergone to extract oil from mineral substances, such as from coral and asphalt; but Pennsylvania seems to be so favorably dealt with by Dame Nature, that the very rocks distil oil into her lap. The north-western part of that State seems to contain quite a number of subterranean springs which yield a limpid oil, some of which we have examined; and quite recently there was a considerable excitement caused by the discovery of a rich oil spring, at Titusville, while sinking a shaft to find a salt spring. This excitement is unabated, as the subjoined extracts from papers issued in the oil region demonstrate:—

"We learn, from the Potter county *Journal*, the following facts relative to the Seneca oil spring, near Titusville, the editor being a native of the aforesaid place. It appears that the 'Pennsylvania Rock Oil Company' purchased the spring of Brewer, William & Co., for the sum of $5,000; and, in 1858, leased it to Mr. E. L. Drake, with the understanding that he should gather the oil at his own expense, and pay them 12½ cents a gallon for it. His lease extended for 15 years, with full privilege of working it at his own option. In May last, he commenced looking for salt, and after sinking a shaft 71 feet, on the first of last month, he struck a fissure through which he was boring, and the discovery of the subterranean spring of oil was the result. The yield per day, up to the period of the recent fire, had increased from 400 to 1,600 gallons. The tract of land on which this spring is located was once purchased by the father of the editor of the *Journal* for a cow, and previously it had been sold at the treasurer's sale for taxes. Now, it is believed, $100,000 would not purchase one acre of it."—*Erie Gazette, Oct. 20th.*

"We learn that an oil spring has been discovered a few miles up the Mullingus Creek, in Spring Creek township, which bids fair to eclipse the Titusville establishment. It has been known for some years that oil rose to the top of the water there, but it has not until recently attratced much attention."—*Warren Mail.*

"The substance known here as "Seneca oil, and about which there is at present so much excitement in this countro, exudes from the rocks, or floats on the surface of springs, in various parts of the world. The name of 'Seneca oil' was derived from the Seneca Indians, a tribe famous in the confederacy known as the Six Nations, and which numbered among its chiefs the great orator, Red Jacket, Farmer's Brother, Big Tree, and Cornplanter, after whom a township in this county is named. The oil in this county was discovered and used by this tribe. The oil is found in abundance at Amiano, in Italy; Birmah, on the borders of the Caspian Sea; on the West India Islands; along the shore of the Kanawha, Virginia; in Kentucky; near Seneca Lake, New York; in western Pennsylvania, generally; and in great abundance in Venango county. The wells of Birmah yield 400,000 hogsheads annually. Its uses are almost endless. As a medicine, it is used both externally and internally; is regarded as an excellent stimulating embrocation in chilblains, chronic rheumatism, affections of the joints, paralysis, and kindred complaints. It is an ingredient in the celebrated 'British oil.' It is also used for making an excellent lamp oil, known as 'Carbon oil,' and is considered, among machinists, as the best lubricator extant. The demand for it cannot be satisfied. In this county, companies are being formed in many localities to dig for it. Mr. Hilands has granted the right to search for it to a large and wealthy Pittsburgh company. Mr. Stewart has leased the well-known Brandon spring, below this place, on the river. Two engines, intended to be used for boring, were landed at our wharf last night, and the work of searching will now be commenced in earnest."—*American Citizen, Oct. 19th.*

TENNESSEE COTTON.—The crop has been excellent this year, and large quantities are pouring into Memphis. The receipts are expected to amount to 400,000 bales this season, the estimated value being from $18,000,000 to $20,000,000. In 1858, 30,000 bales were shipped up the river for the East and West; in 1859, 80,000 bales were shipped in the same direction; and it is expexted that 150,000 bales will take the same course in 1860.

THE DEEPEST ARTESIAN WELL.—The appropriation for carrying on the artesian well at Columbus, Ohio, has been exhausted, and the work has stopped unfinished, with the well at the depth of 2,300 feet—four feet deeper than any other astesian well in the world.

A COLUMN OF INTERESTING VARIETIES.

It is stated that all the fixed stars, as they are called, are in motion; but, though some of the motions are very rapid, the distance of the stars is so great that it will require many thousands of years to produce any considerable change in the appearance of the constellations.....One of the most common causes of baldness, is the presence of an animal invisible to the naked eye, at the root of the hair.....When dead bodies decay, they are converted principally into gases, and pass off into the air, where a portion of them is absorbed by the leaves of plants, and being formed into grain or fruit, is again eaten by animals, and thus travels the great circle of change ordained by the Creator.....The editor of the Warrentown (Va.) *Flag* has in his possession a plain gold ring, 138 years old. It has engraved on it, in the old style these words: "J. W., obit March ye 7th, 1721." It was plowed up by one of the servants on a plantation, in the county of King George. The ring is of pure gold, and is supposed by some to have been the property of the father of General Washington, as the initials we believe, are the same. The owner has been offered and refused the sum of $200 for it.....A man died very suddenly in Pennsylvania from the effects of whisky. The beverage was analyzed, when the chemist reported that he found in it the poisonous constituent of cocculus indicus. The proportion found was two grains to the pint of whisky. This poison is considered fatal to human life in quantities of from five to ten grains, according to circumstances and conditions.....The Pacific wagon road has been finished. During the summer some 1,500 wagons, 12,000 head of cattle, and about 4,000 persons have passed over it. Grass, wood, and water are found abundantly along the route. It commences at the South Pass, leaving the Sage Plains to the southwest, and going directly through the Wasatch Mountains, by way of Thompson's Pass, crosses the head waters of Bear and Great Snake rivers.....An iron steamer was launched in Philadelphia, Oct. 25th, from the yard of Reaney, Neaffie & Co. This steamer is 200 feet long, 29 feet beam, 12 feet hold, and will be propelled by a beam engine, having a cylinder 45 inches in diameter, and 11 feet stroke. She is built in a very substantial manner, and will, it is expected be a fast steamer. She will connect with the Delaware Railroad..... Sweden and Norway are slowly being lifted out of the sea at the rate of from one half to one tenth of an inch per annum. The West coast of Greenland is as gradually sinking.....Petrified remains of shell-fish very closely resembling lobsters have been found in the rocks; some of them over six feet in length.....Coats of arms came into vogue in the reign of Richard I. of England, and became hereditary in families about the year 1192. They took their rise from the knights painting their banners with different figures to distinguish them in the crusades.....The first standing army of modern time was established by Charles VII. of France, in 1455. Previous to that time the King had depended on his nobles for contingents in time of war. A standing army was first established in England in 1638 by Charles I. but it was declared illegal, as well as the organization of the Royal Guards in 1379. The first prominent military band instituted in England, was the yeomen of the guards, established in 1486.....Guns were invented by Swartz, a German, about the year 1378, and were brought into use by the Venetians in 1382. Cannons were invented at an anterior date, they were first used at the battle of Cressy in 1345. In England they were first used at the siege of Berwick in 1405. It was not until 1544, however, that they were cast in England. They were used on board of ships by the Venetians in 1535, and were in use among the Turks about the same time. An artillery company was instituted in England for weekly exercise in the year 1510.....The first railroad constructed in the United States was at Quincy, Mass., connecting the granite quarries with tide water. It was about three miles in length. The Baltimore and Ohio was the first passenger railroad. It was opened in 1830, a distance of 15 miles, with horse power. Next in the order of time came the Mohawk and Hudson, from Albany to Schenectady, 16 miles, opened for travel also with horse power, in the summer of 1831, the first locomotive used in this country was on that road, in 1831. Locomotives were in operation in South Carolina and upon the Ohio and Baltimore road in 1832.

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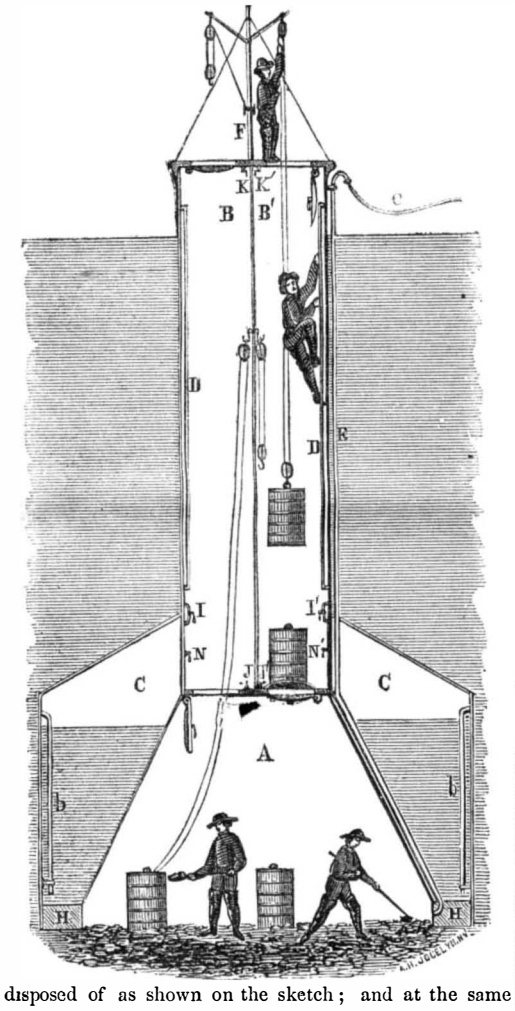
MAILLEFERT'S AEROSTATIC TUBULAR DIVING-BELL.

We here present an illustration of a diving-bell which has been patented in this country, as well as in England, France, &c. The inventor proposes, in addition to the purposes for which it has already been successfully tried, to use it in gathering oysters. He says that the present methods of raking and dragging are very objectionable, bringing up a very small portion of the oysters, actually lying on the banks, and destroying probably more than they bring up. He also proposes to use it for working on the bottoms of rivers, for collecting auriferous deposits in California and elsewhere. A diving-bell is a simple affair, and the peculiarities of this can be easily understood by reference to the cut.

A, is the working chamber, 19 feet diameter at the bottom. The tunnel is divided lengthwise in two compartments, B and B′. C C, is the air chamber; by filling this with air through the cock, N or N′, the bell is raised; by letting out air through the cock, I or I′, it fills with water through pipes, *b b*, and the bell sinks. When the upper man-hole of the compartment, B, (to the left) is closed, the man-hole below can be left open, and the barrels containing the oysters be carried up and



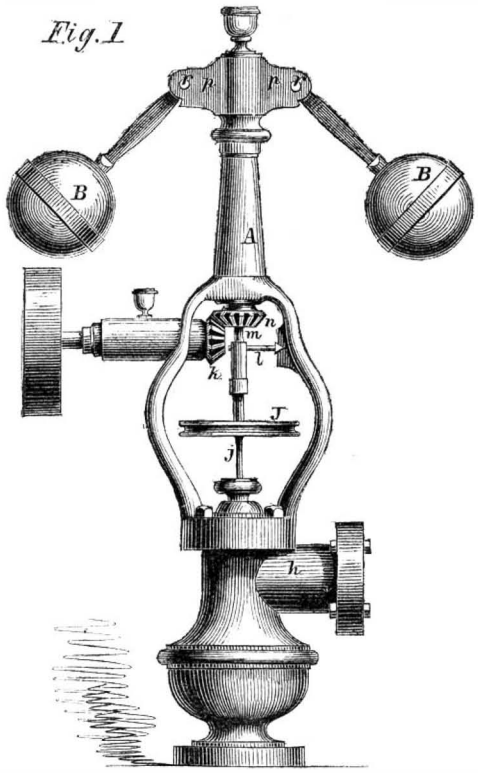
disposed of as shown on the sketch; and at the same time the compartment, B, (to the right) can be emptied through the upper man-hole, its lower man hole being closed as shown on the sketch, and *vice versa*. E, is the pipe connecting the working chamber with the air pump through the hose *e*, the pump forcing the air into the bell and expelling the water. H H, is cast iron ballast. J J′, are the cocks connecting the working chambers with the compartments, B and B′, of the funnel. N and N′, are the cocks to connect the tubes with the air-chamber for filling the latter with air and raising the bell. The raising of the bell will be instantly stopped by turning the cock, N or N , which had been opened for bringing about the motion; the weight of the portion of the funnel which is raised out of water counteracting any tendency to continue the motion upward, the moment the cause by which it was produced is removed, and *vice versa*, the buoyancy of the funnel when it is being immersed will stop the sinking, the moment either cock, I or I′, is shut.

When leaving the bell to stop work, it is allowed to fill with water by opening the cocks, I I′, and the hose, *e*, is unscrewed; when resuming work the hose is attached again, and 20 minutes after, the whole bell will be filled with air and ready for work. F, is a derrick for hoisting the barrels; *b b*, are tubes for letting water in or out of the air-chamber, C C.

The American patent for this bell was obtained through the Scientific American Patent Agency, March 30, 1858, by B. Maillefert, who will be pleased to respond to all inquiries in relation to it, which may be addressed to him at 108 Wall-street, this city.

TRAVIS' STEAM GOVERNOR.

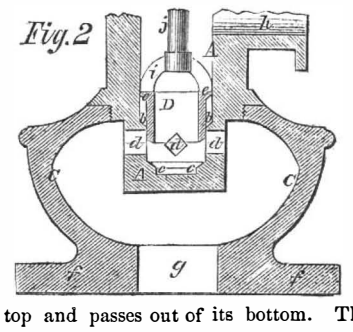
Fig. 1



We have long anticipated an immense growth of manufacturing in the State of Illinois. This State, while it has a larger proportion of arable land than any other in the Union, contains the largest coal field which is known in the world. With these unequaled resources, Illinois is destined, under the influence of republican institutions and free schools, to experience a development of agricultural and manufacturing industry uparalleled in the history of our race. Already a number of inventions of the very highest utility have come from the active minds of her farmers and mechanics; and we hail every new one as a fulfillment of our prophecy, and as an evidence of the growing intelligence of our people.

The engravings which we here present illustrate a governor for steam-engines, which comes to us from Illinois. Fig. 1 is a perspective view of the whole, and Fig. 2 a vertical section of the lower portion, showing the arrangement of the valves. The steam enters from the boiler by the pipe, *h*, and passes into the steam-chest through the opening, *g*. A is a hollow cylinder, with four openings into it, placed at equal distances from each other, with their angles horizontal and vertical, as shown. At the bottom of this cylinder, and on a flanch above the openings, are fitted the seats, *c c* and *d d*, for the short cylinder or valve, D. The valve, D, is hollow, being supported by the bridge, *s*, and the steam en-

Fig. 2



ters its top and passes out of its bottom. The higher the valve, D, is raised, the larger is the portion of the holes, *b b b*, which is opened. The rod, *j*, passes up through a stuffing-box into the hollow cylinder, *k* (Fig. 1), with which it is connected by a screw in such way that it may be raised or lowered by turning the wheel, J; the hollow cylinder being prevented from turning by means of the pin, *l*. The bevel gear, *n*, is fastened upon the lower end of a hollow cylinder which passes up through the inside of the column, E, and has two wings, *o p*, attached to its upper end, so that its rotations carry around the balls, B B. The spindle, *m*, extends upward through the hollow cylinder which carries the balls, and has a groove turned around it near its upper end, in which groove play the inner ends of the arms of the balls. these arms working on the fulcrums, *r r*, at which points they are bent downward. From this arrangement, it will be seen that, as the balls expand, the rod, *m*, is pushed downward, carrying down the rod, *j*, and partly closing the valve; while a depression of the balls lifts the rods, *m* and *j*, and opens the valve more widely. By turning the wheel, J, the rod, *j*, is screwed a greater or less distance into the hollow cylinder, *k*, and thus the valve may be either entirely closed or adjusted to any opening requisite for the desired velocity.

The patent for this invention was granted to Nathan C. Travis, of Alton, Ill., Oct. 11, 1859. Persons desiring further information in relation to it may address the inventor at Alton. Johnson & Emerson, of the same place, have rights for sale for the New England and middle States.

IMPROVED CAP AND LANTERN.

The annexed cut represents a combination of cap and lantern adapted to the use of conductors, miners, brakemen and persons in many other occupations, who require a lantern, and, at the same time, the unobstructed use of both their hands.

Fig. 1

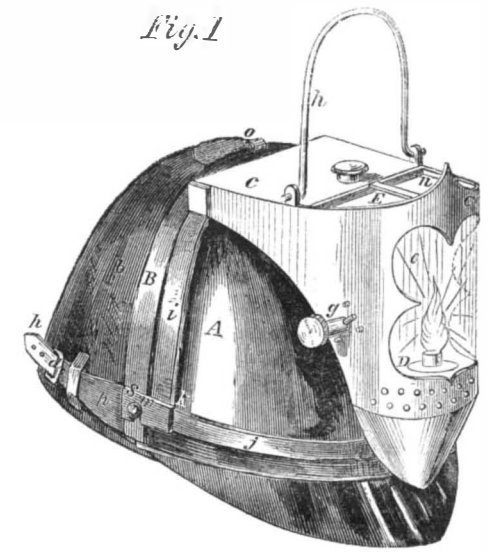


Fig. 2

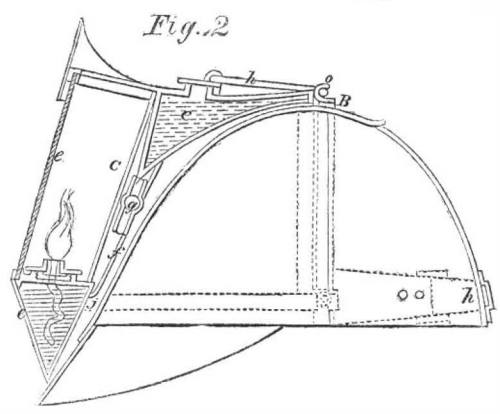


Fig. 4 is a perspective view, and Fig. 2 represents a vertical section. A is the cap, the front part, *a*, being made of leather or similar substance, and the back part, *b*, of rubber cloth or other elastic material, which may be adjusted to heads of different sizes by means of the straps, *h h*, and buckle, *d*. The lantern is made of metal, with a transparent mica plate, *a*, in front of the lamp, and a bright reflector, C, behind it. In the upper and back portion of the cap, a reservoir of oil, *c*, is provided, from which to the lamp a pipe, *f*, leads; the flow of the oil being regulated by means of the stop-cock, *g*. The arrangements for attaching the lantern to the cap are as follows: the metal band, B, which is fastened to the cap, has the hook, *c*, in its middle at the top, and two studs, one of which, *s*, is shown at its ends at the bottom. The lantern is provided with the metal straps, *i* and *j*, with notches near their junction, which fit upon the pins, *s*, and with the bail or handle, *d*, which hooks into the hook, *c*, and by these means the lantern is attached to the cap.

J. C. Cary, of 81 Nassau-street, this city, is the inventor of this cap and lantern, and he will be pleased to answer all questions which may be addressed to him on the subject. His patent was issued (through the agency of this office) Sept. 14, 1858.

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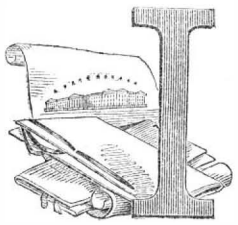
NEW YORK, SATURDAY, NOVEMBER 12, 1859.

REFORM OF THE PATENT LAWS.



IT will be observed in our editorial correspondence from Washington in another column, that this important subject is touched upon, and that new light and life are thrown into it. Our patent laws require but very few alterations, but these are of pressing necessity and vital consequence. We have directed public attention to this subject on several occasions, in former volumes; but as nothing has yet been done effectively in the matter we deem the present moment well fitted for bringing the subject before the members-elect of Congress, and other persons holding high offices in Washington; as great responsibility rests upon them in regard to effecting the necessary reforms during the next session of our Federal Parliament.

We are gratified to learn that the Hon. Commissioner of Patents, although but a brief period in office, has become deeply interested in this question. His position and duties have brought the present evils so prominently before him that he is prompted by duty and generous impulses to exert his influence in the work of reform. Having recently filled the position of a member in the House of Representatives, he has the peculiar advantage of knowing personally many of the present members, and will thus be enabled to exert a salutary influence in bringing about the desired result. If the Commissioner can succeed in getting the favorable action of Congress upon a reform bill, he will be entitled to, and will receive, the gratitude of the whole host of inventors and patentees.

The reforms required are very reasonable, and we believe that, if presented in the proper light, they will meet with the entire approbation of Congress. The bill reported by the late Senator Evans, in 1858, published on page 222, Vol. XIII, SCIENTIFIC AMERICAN, covers nearly the whole of the required amendments. We recal attention to this bill, because it affords a good foundation for legislative action, and it will avoid the labor and trouble of commencing the work *de novo*. As we reviewed its principle sections on page 229 of the volume just referred to, we will not take up space with going over the same ground again, but will content ourselves with noticing, briefly, two or three prominent features requiring prompt attention.

1. *Interfering Cases.*—According to our law, the original or first inventor alone is entitled to a patent. The principle upon which this action is based is no doubt correct; but the manner in which it is sometimes applied is very wrong. Thus, for example, if A were to invent an improvement to-day, and secure a patent for it to-morrow; he may be dispossessed of it, after it has been held for several years without a single question being raised regarding its validity during all that period. To do this, another inventor, B, has only to prove that he discovered this same improvement first, and that he was prevented by untoward circumstances from applying for a patent at an earlier date. There are instances on record where patents have been set aside by such actions, after the first patentees have been at an enormous expense in introducing their inventions and building machinery to operate them. Very great injustice has been done, and great hardships suffered by innocent parties on account of this feature in our patent law. That such an evil should be removed from our patent system no one will deny; but the question is, how shall this be done and yet carry out the just principle of granting patents to original inventors only? It is proposed, for this purpose, that the fee for filing a caveat shall be so reduced as to enable every inventor, however poor, to take advantage of it and record his improvement nearly as soon as it is conceived, and that the date of the caveat be the only evidence allowed of priority in invention. Such an amendment of the patent law will fully protect inventors in their just rights, and make patents (as they should be) inviolate, except in cases of fraud. We hope to see such an amendment, or one equally as effective, adopted at the next session of Congress.

2. *Fees of Foreigners.*—Our patent laws contain odious distinctions in the amount of fees required from foreigners. A citizen of Great Britain is charged $500, and the citizens of all other foreign nations only $300; this is neither just nor republican in principle. England charges our citizens higher patent fees than we do, but much less than we charge her citizens; and, to her honor be it spoken, she charges *all alike*—the American stands on the same platform with the Englishman, in securing a patent. It should be the same with us; and we see no reason why the patent fee should not be reduced for all foreigners to the same standard as that for our own citizens. Such a reform could do no harm, but an enormous amount of good, as it would invite the best foreign mechanics to seek protection for their inventions in our country, and thus be the means of introducing every valuable improvement from abroad. Our attention has been particularly directed to this feature, at the present time, by a petition from the committee of the Manchester (England) Patent Law Reform Association, to Duncan Macauley, Esq., the American consul in that city. This petition is signed by no less a person than William Fairbairn, the great engineer, who points out the impolicy of the very high patent fee imposed upon British subjects by our law, and requests the consul to lay the matter before our government. The petition pays a high compliment to inventors, and points out what discoveries in science and art have done to increase commerce and advance civilization. We cannot forbear quoting two of its clauses because they are so full of the right spirit:—

"That, in order to develop, to the fullest extent, inventive talent, every encouragement and security should be given to inventors consistent with the public welfare.

"That, for many of the most valuable discoveries and inventions, we are indebted to the expansive minds of operatives and individuals in humble life, who are prevented from securing to themselves the advantages of their inventions, on account of the present expensive process of obtaining patents."

So far as it relates to foreign inventors, our patent law is grossly aristocratic. A poor English or French mechanic is totally unable to obtain an American patent, unless he finds some rich man, upon whom he must become a dependent, to advance the patent fee. This is not republicanism.

3. *Evidence before the Commissioner.*—We have but little space to devote to this head, and will therefore conclude with a very few remarks. The patent law requires the Commissioner to make just decisions upon testimony relating to all the cases presented before him for adjudication; and yet no provision is made to enable him, as in trials at common law, to compel the attendance of witnesses, so as to develop the whole truth in relation to the question at issue. Such a broad defect in the law is apparent to every person. The most important witnesses in such cases can snap their fingers and refuse to utter a word on the side of law, truth and justice.

THE SILKERY OF THE SKIES.—In a communication from E. Merriam in the *New York Times* of the 20th ult., he endeavors to prove that the aurora borealis is a material substance of "exquisite softness and silvery luster" which he has denominated "the silkery of the skies." This he conceives is produced from volcanoes throwing matter up into the heavens during their eruption, and he is also of opinion that meteoric showers result from aurora borealis. Such a theory cannot be sustained by facts. As the aurora takes place almost every night, in the Arctic regions, of course it would require a volcanic eruption every night to produce it, in those localities; therefore, as it is well known that no such volcanic eruptions take place, we must attribute the phenomena to atmospheric influence connected with electricity, as the best explanation yet devised by men of science.

EDITORIAL CORRESPONDENCE.

WASHINGTON, Nov. 1, 1859.

Washington is, according to geography, the federal capital of the United States. It will be found to contain, at almost any season of the year, a large number of living celebrities; in fact, it is asserted upon competent authority that it contains the well-known "White House," where, in the retirement of his domicile, a venerable bachelor indulges in his reveries. These reveries are supposed to consist of varied gyrations and evolutions of huge government wheels forming a part of a monstrous machine invented and patented in part by "Uncle Samuel"—a man of wisdom, gravity, and profound conceit—a sort of "Sir Oracle" whose word is law. The latter personage, although little over eighty years of age, and although hale and hearty—taking his three meals a day with some extras, and regularly digesting the same—is nevertheless sometimes called an "old fogy;" and there are symptoms, about once every four years, of his being ousted; yet it is found, after the due process of electioneering and voting, that the old gentleman remains there still, quietly presiding over the affairs of the nation.

Strolling along the broad Pennsylvania-avenue, the other day, arm-in-arm with a friend, we met the impersonation of "Uncle Sam," arranged in good old homely semi winter garb. There was no want of elasticity in his step, and even the cane was slung carelessly under his arm as a useless appendage. Imitating the example of other well-bred folks, we tipped our beaver; and in return we received the Chief Magistrate's very courteous acknowledgement. Leaving all the officers of the government, from the Head downward, to the full enjoyment of all the honors, emoluments, pabulum, and physic that belongs to them, we will come back to the federal city, and propose briefly to touch upon the the old and perhaps stale complaint against its incongruity of arrangement. Nothing more painfully impresses the stranger who visits Washington than the utter want of taste and good judgment displayed in locating the public buildings. Washington was planned under the direction of the "Father of his Country," by Pierre C. l' Enfant; and the purpose was to have broad avenues of direct communication, so as to connect the separate and most distant objects with the capital, and to preserve throughout the whole a *reciprocity* of sight at the same time. After the public buildings were burned in 1814, and it was settled that the city should remain the seat of the general government, it is astonishing that some common sense did not obtain a hearing on this subject. If the government buildings had been erected on all sides of one grand square, with the usual botanical and horticultural accessories, we could now bid defiance to all competition in this respect, instead of presenting a system which, for uncouth jumbling, has hardly an equal; but what is the use of complaining now? for those who were guilty of this foray on good taste and sound judgment are most of them altogether beyond the reach of the soundest "basting" which could be applied to them.

It has become part of my education to regard the Patent Office as the most interesting department of the government. What is it to me if our venerable Secretary of State has a bit of a brush with Lord John Russel, about "boundary lines" and "54° 40′?" Supposing Mr. Holt has found out that some western postmaster is a little shaky "on the goose?" These things neither excite my mind, nor move a single muscle in my frame. If the Post-office Department does not work all right, I can scold; and if it *does*, this is no more than I have a right to expect; no thanks to Mr. Holt. In the Patent Office, however, we find a different state of things. Here, inventive genius is represented in modeled forms, after having been triturated, shaken up, and boiled down to a concentration, the study of which opens to the mind an almost boundless field of thought and contemplation. Could these models but tell the lives of their projectors, what a crowd of reminiscences would they reveal, of researches involving an amount of patience that might elicit the approbation of the patriarch Job himself, of toils, struggles, disappointments, sacrifices, hope deferred, and, in many instances, successful achievements; the whole forming an unwritten history more glorious than the chronicles of "grim-visaged War."

Not far from where I am now sitting is a huge "lightning" press, throwing out its thousands of sheets every hour. If I wish to study this ponderous piece of mechan-

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ism, which confuses and baffles the judgment while in operation, here, in the Patent Office, is its perfect miniature representation, which I may handle, turn upside down, and examine with the utmost facility. Just over the way, I can hear the constant tapping of a wondrous little instrument; and I peer wistfully around the curtained partition, hoping to see what is going on. I am confronted by the words, "No admittance," and my curiosity is hightened, for surely some mystery is being enacted here. Is this "the Devil and Dr. Faustus?" If not, what else can it be? At the Patent Office, this seeming enigma is made plain as day; the apparatus is simply a machine for taming down the electric fluid, and employing its swift wings for the transmission of that which concerns the business and bosoms of men. And thus, from the day when General Jackson, while journeying through the West, on his way to assume the office of Chief Magistrate, undertook to bring on the model of an old saddle-tree, and get out a patent for it, to accommodate an old soldier—from that day until the present hour, this noble edifice has been the depository of the ingenuity of our inventors, who, in spite of all the contumely which would-be-wise men have undertaken to heap upon them, have done more to advance the material interests of the country than any other class of our citizens. Upon the records of the Office we find the honored names of Eliphalet Nott, Whitney, Morse, Hamilton, Jennings, Mott, Hoe, Blanchard, Ericsson, Goodyear, Winans; and even that ubiquitous citizen, *Smith*, has taken out a great many patents, along with a host of others whose names would fill a dozen sheets like this.

On entering the Patent Office—one of the grandest architectural edifices to be found in the world—a sensation of mystery crowds upon the mind. We inquire for the official custodian of the innumerable mysteries which surround us; we find him to be the Hon. Wm. D. Bishop, late member of Congress from Connecticut—a State abounding in ingenious men. He is a proper arbiter of their claims before this interesting bureau; for, united to other qualifications which fit him for the honorable sphere in which he is now placed, he possesses a mechanical element in the constitution of his mind which enables him *to see through* every invention brought to his notice. It is not, however, the Commissioner's duty to examine all applications made for patents; associated with him in the discharge of his duty, there is a Chief Clerk, S. T. Shugert (a faithful officer), twelve Chief Examiners, twelve Assistant Examiners, and a bevy of clerks and messengers employed in various subordinate departments of the Office. Each Chief Examiner and his assistant have a room set apart for their own special use; they regularly examine a classified list of applications, and may be regarded as the *executioners* of the Patent Office. Many an honest inventor, with an enthusiasm peculiar to his species, has had his hopes suddenly "guillotined" by these inquisitorial officials, whose duty, when faithfully discharged, is a most delicate and responsible one, for it requires a discriminating and well-balanced judgment to guard against too much liberality on the one hand, or injustice on the other. The mind of the Examiner works towards its conclusion in two different channels or modes of thought; the result intended to be reached in each case being the same. One Examiner (this is the minority class) carefully examines the applicant's papers, and having obtained the requisite knowledge of the points claimed, starts on his excursion of inquiry, hoping he may discover unequivocal evidence of a want of novelty which will justify the rejection of the application. Another Examiner, pursuing towards the same end, hopes he may be able to discover something new in the applicant's model, whereby he may pass the case for issue—prompted by the feeling that, if there is any reasonable doubt on his mind, he will turn it rather in favor of the inventor than against him; for it is unquestionably better that a dozen patents should be granted for what is *not* new than that one inventor should be deprived of his just and equitable rights. A patent granted for what is old is worthless; but if one inventor is deprived of his just rights at the Patent Office he would scarcely expect to recover them from an outside tribunal.

In reference to the condition of the Patent Office, I may with propriety state that on no former occasion have I ever visited it when a better system or more uniformity of action prevailed. There seems to be a disposition on the part of every one connected with the Office to do his duty faithfully, and to recognize the ruling authority. The new Commissioner is well liked in the Office; and, so far, he finds his duties agreeable, and I may safely predict for him a successful official career. He feels a deep interest in the success of a patent bill which will knock off the rough corners of our present system. In the main he is believed to be friendly to the bill reported at the last session, and proposes to engraft upon it some important changes, whereby questions of interference may be more readily settled and thus give more stability to patents after their issue, or in other words, to put an *estoppel* upon the right of one inventor to contest the patent of another on a question of priority (except in cases of fraud), unless this claim is set up within a reasonable time after the patent has issued; leaving the question of the validity of the patent thus granted properly in charge of courts of competent jurisdiction. Such a provision is much needed, as I believe there is now a question of interference pending between an applicant and a patent of some eight years' standing.

A very important patent case was argued before the Commissioner of Patents on the 27th ult. Thaddeus Hyatt, the original patentee of his peculiar illuminated tile or load-sustaining grating (now becoming so extensively used in large cities for lighting vaults and basement extensions), has asked for a renewal of his patent for a period of seven years, as provided for by the section of the act of 1836. The applicant presents a formidable array of testimony to sustain his claim, and is confronted by remonstrants who scrupled not to bestow upon him some pretty choice compliments. The attention of the Hon. Commissioner was called by one of the counsel to the "stupendous audacity" of the applicant. The case, for the most part, was ably conducted; and its more spicy passages afforded considerable amusement to the spectators present. At the time of my writing, the case has not been decided; and it is impossible to foreshadow, with any degree of certainty, the result. There are some interesting points involved in this case which will invite examination. I forbear to touch upon them at present.

I observe that an extract in the SCIENTIFIC AMERICAN, page 288 (copied from the Baltimore *Sun*), mentions that the Commissioner of Patents would not put in an estimate, as usual, for printing the agricultural report. This is an error. An estimate will be put in, and the responsibility of adopting or rejecting it will rest solely with Congress.

MARE'S NESTS IN PORKOPOLIS.

A cotemporary attempts to "corner" us in the following style:—

DO HOGS HAVE HORNS?—The prussiate of potash is made in large quantities in Cincinnati, from hoofs, horns, and other refuse of slaughtered grunters.—*Scientific American.*

Begging your pardon, Mr. Scientific, allow us to remark that swine do not wear "horns" in this region. Please add that to your scientific information.—*Cincinnati Gazette.*

We had frequently heard of the "horned hoss," and it seems probable from the above quotation that, while undertaking to muckle a piece of Cincinnati hog, the idea floated through our imagination that they were chiefly made up of hoofs and horns. We are happy to know that they are like other people's hogs.

ARE COW HIDES MIXED WITH MORTAR?—Cow hides taken from the hides in tanneries is employed for making plastering mortar, to give it a sort of fibrous quality.—*Scientific American.*

Cow hides "is" also sometimes "employed" in facilitating the acquisition of the rudiments of grammar, among very dull scholars.—*Cincinnati Gazette.*

We are of the opinion that cow hides work better into boots and shoes than they do into mortar for plastering walls. Our cotemporary, however, never saw any such paragraph as the above in the SCIENTIFIC AMERICAN, and must have found it in some other journal. We don't feel willing to shoulder other people's blunders if we can help it. We find the type sufficiently treacherous in our own office without being held responsible for the pranks they play in other offices.

A NEW ANTHRACITE FURNACE.—The Reading *Times* says that a large anthracite furnace, situated on the canal, one mile above Douglasville, will be completed in about a week. It is capable of making 100 tuns of iron per week, but will not go into operation at present, or indeed until some radical change is made in the tariff.

PATENT CASES.

Caustic Alkali.—We have received the record of the case tried before Judge Grier, Oct. 27th, at Philadelphia, in which the Pennsylvania Salt Manufacturing Company were the complainants, and T. Conrow and Isaac Barber were the defendants. The plaintiffs alleged that George Thompson was the true, original and first inventor of an improvement in devices for putting up caustic alkalies, not known or used at the time of his application for a patent, which was issued on the 21st day of October, 1856, to Thompson, and on the 26th day of January, 1857, transferred to the complainants. On the 1st day of February, 1859, re-issued Letters Patent were made to Thompson for the improvement, and he again transferred his right to the complainants. They complained that the defendants have infringed upon their rights, as they are using the improvement in the eastern district of Pennsylvania, without authority from them. A motion was made in the case, asking for an injunction restraining the defendants from selling caustic alkalies, packed in tin cans, called "Condensed Lye." After argument, the Court granted the prayer of the bill, and an injunction was issued to restrain from selling said improvement.

Gates.—Before Judge Grier, the case of Robert Wood, complainant, C. White and several others, defendants, for infringing the patent for a gate, was decided on Oct. 31st. The complainant alleged that he was the assignee of the patent granted to H. E. Wesche, on Feb. 12, 1856, for an improvement on gates. Mr. Wood brought suit against the defendants, asking for a special injunction against them, restraining them from using said design for gates. After argument, the Court allowed the injunction to issue, upon the filing of an additional affidavit.

A BEETLE IN A TRAVELER'S EAR.

The whole interior of the tent became covered with a host of small black beetles, evidently attracted by the glimmer of the candle. They were so annoyingly determined in their choice of place for peregrinating, that it seemed hopeless my trying to brush them off the clothes or bedding, for as one was knocked aside, another came on, and then another, till at last, worn out, I extinguished the candle, and with difficulty—trying to overcome the tickling annoyance occasioned by these intruders crawling up my sleeves and into my hair, or down by back and legs—fell off to sleep. Repose that night was not destined to be my lot. One of these horrid little insects awoke me in his struggles to penetrate my ear, but just too late; for in my endeavor to extract him, I aided his immersion. He went his course, struggling up the narrow channel, until he got arrested by want of passage-room. This impediment evidently enraged him, for he began with exceeding vigor, like a rabbit at a hole, to dig violently away at my tympanum. The queer sensation this amusing measure excited in me surpassed description. I felt inclined to act as our donkey's once did, when beset by a swarm of bees, who buzzed about their ears and stung their heads and eyes until they were so irritated and confused that they galloped about in the most distracted order, trying to knock them off by treading on their heads, or by rushing under bushes, into houses, or through any jungles they could find. Indeed, I do not know which was the worst off. The bees killed some of them, and this beetle nearly did for me. What to do I knew not. Neither tobacco oil, nor salt, could be found; I therefore tried melted butter; that failing, I applied the point of a penknife to his back, which did more harm than good; for though a few thrusts kept him quiet, the point also wounded my ear so badly, that inflammation set in, and severe suppuration took place, and all the facial glands extending from that point down to the point of the shoulder become contorted and drawn aside, and a string of bobus decorated the whole length of that region. It was the most painful thing I ever remember to have endured; but, more annoying still, I could not open my mouth for several days, and had to feed on broth alone. For many months the tumor made me deaf, and ate a hole between that orifice and the nose. Six or seven months after this accident happened, bits of the beetle, a leg, a wing, or parts of its body, came away in the wax. It was not altogether an unmixed evil, for the excitement occasioned by the beetle's operations acted towards my blindness as a counter-irritant by drawing the inflammation from my eyes. Indeed, it operated far better than any other artificial appliance.—*Journey of a Cruise on the Tanganyika Lake, Central Africa.*

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WEEKLY SUMMARY OF INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page.

FRENCH YOKE SHIRT.

This invention relates to a novel form of that portion of the shirt which is technically termed the yoke, whereby the shirt is made to fit the wearer far better than those made in the ordinary way, and the shirt also allowed to conform to the motion and position of the body far better than usual. By this mode of manufacture a good fit, so difficult hitherto to obtain, may be procured without difficulty. This is the invention of L. S. Ballou, Jr., shirt manufacturer, No. 409 Broadway, New York.

PLATFORM SCALES.

This invention relates, first, to an improvement in the scale beam; second, to a mode of hanging the platform and applying the same to the levers which form a connection between it and the beam. The object of the invention is to enable the platform to adjust itself properly to the levers on which it rests, also to make suitable provision against difficulties attending the winding or twisting of the platform timbers, and to facilitate the movement or adjustment of the weight on the beam and the noting of the weight of articles counterpoised on the platform. This is the invention of R. F. Wolcott, of Claremont, N. H.

FLOUR-PACKER.

The object of this invention is to obtain a device whereby flour, meal, or other similar substances that are packed in receptacles, may be packed therein in equal quantities, or very nearly so, so that each receptacle will be supplied with a certain requisite weight of the material packed. In the machines hitherto employed for this purpose, the only guide in packing the requisite amount of material in the receptacles has been the size of the latter, and as barrels will vary considerably in dimensions even when carefully made with a view to uniformity in that respect, and as sacks will stretch and expand considerably, a great deal of time is consumed in weighing and adjusting the proper quantity of material in each receptacle after it is packed. This difficulty is obviated by packing the material within a cylinder or measure attached to the machine, and forcing the material, when packed, from said cylinder or measure into the receptacle prepared to receive it, thereby insuring a uniform supply for each receptacle, or very nearly so; the difference being so trifling that the weight can be made correct after packing, with but very little trouble or delay. The inventor is Joseph Bartholomew, of Union, N. Y.

EMBOSSING AND FINISHING WOVEN FABRICS.

W. Ralston, of Manchester, England, has a plan for ornamenting woven fabrics, which is explained by the following extract from the specification:—"I employ a roller of metal, wood, or other suitable material, and groove, flute, engrave, mill, or otherwise indent upon it any desired design, and cause it to revolve with a bowl or bowls of paper, or other substance, and by means of gearing well known to mechanics, I give the circumference of the pattern roller a quicker motion than the circumference of one of the bowls, so as to obtain a frictional action upon the surface of the fabric as well as pressure, so that, if the fabric is moved transversely when fed to the machine, an indefinite number of watering patterns may be given to the fabric at one operation or passage; but if two operations be given, moiré antique or other varieties may be obtained, which can be still further varied, as desired, according to the number of times the fabric is allowed to pass through the machine."

SAW ADJUSTMENT.

This invention consists in interposing between the fixed collar of the saw shaft and the saw, a ring of copper or other suitable metal, and then locking the saw upon the shaft by a loose collar and nut in the usual manner of hanging saws of this description. The inventor is John Colville, of Wilmington, N. C.

MODE OF MANUFACTURING PULLEYS.

The object of this invention is to facilitate and expedite the manufacture of cast metal shieves or pulleys, such as are used for window sash ropes and similar purposes, by casting the pintle or axis of the wheel or roller simultaneously with the casting of the shell, so as to avoid the usual manipulation or labor attending the fitting of the wheel or roller within the shell after the latter is cast. The invention consists in having the wheel or roller inclosed within the cone of the shell and having the eye of the wheel open, so that, in casting the shell, the melted metal will pass through the eye and form the pintle or axis of the wheel, which is allowed to turn freely thereon when the sand portion of the cone is removed. The inventor is John A. Evarts, of West Meriden, Conn.

DISTILLING APPARATUS FOR COAL, &C.

The object of this invention is to save the gas which is now wasted in the manufacture of coal oil, because the gas which is generated in the coal oil retorts (notwithstanding the much lower temperature necessary to convert the coal into oil than to convert it into gas) has not the pressure necessary to make the same useful for illuminating purposes, and if this pressure is given to it in the ordinary way, the quantity of oil obtained from the coal is diminished. This invention consists in drawing the gas from the oil retort by means of a pump, and in forcing the same through a gas retort in which it is exposed to the influence of better gas obtained by heating resin, pitch or some other bituminous substance in said gas retort, and at the same time the necessary pressure is imparted to the gas by said pump, which is of particular construction, so as to regulate the flow of the gas. This apparatus is the invention of H. K. Symmes, of Newton, Mass., and one half is assigned to R. W. Holman, of the same place.

MACHINE FOR POLISHING RICE.

Amongst the various machines for this purpose which have come to our notice, this seems to be the simplest and most effective. The grain is operated on by a series of adjustable scouring disks, and it is fed to the same by particularly arranged conductors in the interior of a wire-cloth cylinder, so that each grain is acted on thoroughly before it is allowed to escape from the wire cloth cylinder or bolt. By combining a series of these conductors and scouring disks with bolts of different fineness, the flour, the chips, the broken rice and the whole grains may be separated. This machine is the invention of Charles E. Rowan, of this city.

SEWING-MACHINE.

The object of this invention is to adapt the sewing-machine to quilting or other similar work, where the cloth or material to be sewed remains stationary. The machine is propelled on the surface of the cloth by means of the needle, which is made of such a form that the same in going down, and, as soon as the looper is withdrawn from the cloth, gives to the machine the required motion. Both the needle and the looper pass through the cloth in inclined directions, and they are operated by means of grooves and guide-pins in such a manner that the holes made by the same are not increased as they are withdrawn from the cloth. This sewing-machine is the invention of Henry Hudson, of Three Springs, Pa.

PROJECTILES FOR RIFLED ORDNANCE.

J. W. Cochran, of New York City, has an improvement which relates to the application to the exterior of a projectile (shot or shell) for rifled ordance, of a shirt or case of soft metal, to be expanded by the admission to its interior of the gases eliminated by the explosion of the gunpowder when the gun is fired, and thereby caused to enter the rifle grooves of the gun and so to receive and give to the projectile a rotary motion. This improvement consists in so constructing the shirt or case and the projectile to which it is applied, and so combining them, that the passages for the gas to expand the shirt or case are formed between the projectile and the shirt or case, and with their entrances in the shirt or case itself, without perforating and thereby weakening the projectile, and that the shirt or case may be carried separate from the projectile, and thereby, in a great measure, prevented from being bruised or otherwise injured in transportation, but may be put on instantaneously by the gunner preparatory to the insertion of the projectile in the gun.

RAILROAD RAILS.

During the last half century, the subject of railroad improvements has much occupied the minds of inventors, and many decided benefits have resulted from the practical application of their ingenuity; but the improvement in the construction of rails just patented by G. W. R. Bayley, of Brashear, La., possesses marked advantages over all preceding inventions of the above class, inasmuch as it combines both lightness and strength in a greater degree, and at the same time is a reversible rail. The invention consists in the combination of the double-head with the flat-footed rail; it being flat-footed one side and double-headed—so far as the wheel tread is concerned—on the other. The neck or stem of the rail is placed on one side of the center line of the tables, so that, when the rail is laid down upon the cross ties, the thin edge to the rail head at the rail base is inside, and outside at the rail tread, forming a Z-rail, which is reversible. Thus, the weight of the rolling load will be brought immediately over the rail stem—a desideratum never before attained with the same lightness and strength combined.

SLIDE VALVES.

This invention consists in the employment, for the induction, cutting-off and eduction of the steam in a steam-engine, of two slide valves, working one inside of the other and upon the same seat, in such a manner that the outer one constitutes an induction valve and variable cut-off, and the inner one, which is driven by the other one but makes a shorter stroke, constitutes the eduction valve, and provides for a free exhaust throughout nearly the whole stroke of the piston. The object of the invention is to obviate the difficulty heretofore experienced of providing for a free exhaust, when the main slide valve is used both as an induction valve and a cut-off. This is the invention of Nathan Cope, of Cincinnati, Ohio.

FOREIGN SUMMARY—NEWS AND MARKETS.

One of the new steam frigaets, called the *Orlando*, belonging to the British navy, was built, it is stated, after the model of the *Niagara*—our largest American frigate. It seems, however, that there has been something decidedly wrong about the construction of her machinery and the operation of the screw, as she vibrates, while running, in a most awful manner. Her engines are very powerful, and on her first trial trip she attained an average speed of 13 knots per hour, which was much below what her engines warranted all in expecting. It was then suggested that the corners of her screw blades be cut off, as such a course had resulted in an increase of speed, and a more steady motion, in the case of the *Mersey*, another steam frigate. This was done, and two pieces, five feet four inches long were cut off, the pitch reduced, and another trial trip made. There was a slight change experienced in the steadiness of the vessel, but the vibration was still very great, and the rigging shook so violently that it was dangerous for seamen engaged on it. Instead, however, of increasing the speed, it had been decreased, to the surprise of every person on board, although the engines worked up to 4,200 horse-power. The *Orlando* was now trimmed in her load, bringing two heavy guns from her stern to the forecastle, so as to have the draft 21 feet 2 inches, at the bow, and 22 feet 5 inches at the stern, and another trip was made. The vibration was now found to have slightly decreased, and the speed somewhat increased; still, as a whole, the frigate is held to be very defective in operation, without the engineers and builders being able to tell exactly why this should be so.

Sir John Bowring has made a tour of the English manufacturing districts and delivered several interesting addresses to the people. He stated that the recent census of China had shown that it contained a population of 412,000,000 inhabitants, and that the arts in that empire were in a very advanced state when England was in a state of barbarism. Why had not China kept in advance of England? One reason why the Chinese are stationary is their books, which are almost worthless in regard to teaching. The wisdom of one generation is not added to another, the people always walk in the old paths, they care nothing for the future, little for the present, but worship the past. They do not want to be wiser than their ancestors; hence they never progress, but remain in a fixed forlorn condition. They have one system, however, which, he thought, exhibited more wisdom than was to be found in England, namely, a decimal currency. He never knew a Chinese to make a mistake in an account, and they had more sense than to divide by 4, 12, and 20, as is done in English currency. One great and grand method of government examination of scholars took place every year at Canton. Thousands competed for prizes, from all parts of the country, and men of all ages, from 20 to 70 years, were candidates; neither age nor condition of life debarred competitors.

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The city of Manchester, England, has reduced the price of its gas from 5*s.* 6*d.* to 4*s* 6*d.* per 1,000 cubic feet. The profits of the company, last year, were 30 per cent. In several other towns there has been a reduction in the same ratio.

In a letter to the London *Engineer*, Mr. F. Braithwaite states that during experiments with two heavy freight engines, passing over a bridge, the deflection was 2½ inches at the center, whether the engines were running fast or slow. The editor of the *Engineer* states that the amount of deflection by trains running fast and slow over a bridge depends upon its form. The deflection is greater with a passing than a stationary load, when the bridge is level; when it is cambered, the deflection is greater with a stationary than with a passing load.

We omit our usual table of metal prices this week, as there have been no changes in the prices worth noticing.

New York Markets.

COAL.—Authracite, $4.50; Liverpool orrel, $9; cannel, $1.50.

COPPER.—Refined ingots, 22½c. per lb.; sheathing, 26c.; Taunton yellow metal, 20c.

CORDAGE.—Manilla, American made, 8⅜c. per lb.; Rope, Russia hemp, 11 to 11½.

COTTON.—Ordinary, 8¾c. a 9c.; good ordinary, 9⅜c. a 10c⅜.; middling, 11⅜c. a 11⅞c.; good middling, 12⅛c. a 12⅞c.; middling fair, 12⅝c. a 13⅛c.

DOMESTIC GOODS.—Shirtings, bleached, 26 a 32 inch per yard 6c. a 8c.; shirtings, brown, 30 inch per yard, c. a7¼c.; shirtings, bleached, 30 a 34 inch per yard, 7 a 8½c.; sheetings, brawn, 36 a 37 inch per yard 5½ a 8¾c.; sheetings bleached, 36 inch per yard, 7⅞ a 15c.; calicoes, 6c. a 11c.; drillings, bleached, 30 inch per yard 8¾ a 10c.; cloths, all wool, $1.50 a $2.50; cloths, cotton warp, 85c. a $1.37; cassimeres, 85c. a $1.37½; satinets, 30c. a 60c.; flannels, 15c. a 30c.; Canton flannels, brown, 8½c. a 13c.

FLOUR.—State extra brands, $4⅛ a $4.95; State, superfine brands, $4.75 a $4.80; Ohio fair extra, $5.35 a$5.60; Ohio common brands, $4.90 a $5; Michigan,Wisconsin, Indiana, &c., $5 a $5.40; Genesee, extra brands, $5.50a $7; Missouri, $4.90 a $7; Canada, $5.30 a $6.30; Richmond, city $5.50 a $7.25; Richmond, country, $5 a $5.25; Rye, fine, $3.60 a $3.75; Corn meal, Jersey, $4.06 a $10.

HEMP.—American undressed, $140 a $150; dressed, from $190 a $210. Jute, $80 a $85. Italian, $275. Russian clean, $200 per tun. Manilla, 6½c. per lb.

INDIA-RUBBER.—Para, fine, 65c. per lb.; East India, 45c. a 52c.

INDIGO.—Bengal, $1 a $1.50 per lb.; Madras, 75c. a 95c.; Manilla, 60c. a $1.15; Guatemala, $1 a $1.15.

IRON.—Pig, Scotch, per tun, $23.50 a $24; Bar, Swedes, ordinary sizes, $87 $90; Bar, English, common, $43 a $44; Sheet, Russia, first quality, per lb., 11¾c. a 11¾c.; Sheet, English, single, double and treble, 3 1-16c. a 3⅞c.; Anthracite pig, $24 per tun.

IVORY—Per lb., $1.25 a $1.80.

LATHS.—Eastern, per M., $1.95.

LEAD.—Galena, $5.70 per 100 lbs.; German and English refined, $5.55 a $5.60; bar, sheet and pipe, 6c. a 6¼c. per lb.

LEATHER.—Oak slaughter, light, 31c. a 32c. per lb.; Oak, medium, 31c. a 33c.; Oak, heavy, 30c. a 31c.; Oak, Ohio 29c. a 31c.; Hemlock, heavy, California, 20¾c. a 21¾c.; Hemlock, buff, 15c. a 18c.; Cordovan, 50c. a 60c.; Morocco, per dozen, $18 to $20.; Patent enameled, 16c. a 17c. per foot, light Sheep, morocco finish, $7.50 a $8.50 per dozen.; Calf-skins, oak, 57c. a 60c.; Hemlock, 56c. a 60c.; Belting, oak, 32c. a 34c.; Hemlock, 28c. a 31c.

LUMBER.—Timber, white pine, per M feet, $17.50; Timber, yellow pine, $35 a $36; Timber, oak, $18 a $28; Timber, eastern pine and spruce, 18 a $15; White Pine, clear, $35 a $40; White Pine,select,$25 a $30; White Pine, box, $14 a $18: White Pine, flooring, 1¼ inch dressed, tongued and grooved, $24.50 a $25; Yellow Pine, flooring, 1¼ inch, dressed, tongued and grooved, $29 a $32; White Pine, Albany boards, dressed, tongued andgrooved, $20 a $21; Black Walnut, good, $45; Black Walnut, 2d quality, $30; Cherry, good, $45; White Wood, chair plank, $45; White Wood, 1 inch, $23 a $25; Spruce Flooring, 1¼ inch, dressed, tongued and grooved, each, 22c.a 24c.; Spruce Boards, 15c. a 17c.; Hemlock Boards, 12½c. a 14c.; Hemlock wall strps, 10c. a 11c.; Shingles, cedar, per M, $23 a $35; Shingles, cypress, $12 a $25; Staves, W. O. pipe, light, $55 a $58; Staves, white oak, pipe, heavy, $75 a $80; Staves, white oak, pipe, culls, $30 a $35; Staves, do. hhd., heavy, $70; Staves, do. bbl. light, $30 a $35; Staves, do. bbl. culls, $20; Mahogany—Duty, 8 per cent. ad. val. —St. Domingo, fine crotches, per foot, 35c. a 45c.; St. Domingo, ordinary do., 20c. a 25c.; Honduras, fine, 12½c. a 15c.; Mexican, 13c. a 15c.

NAILS.—Cut at 3c. a 3¼c. per lb. American clinch sell in lots, as wanted, at 5c. a 6c.; wrought foreign, 3¾c. a 3½c.; American horse-shoe, 14¼c.

OILS.—Linseed, city made, 57c. per gallon; linseed, English, 57c.; whale, bleached winter, 58c. a 60c.; whale, bleached Fall, 58c.; sperm, crude, $1.35; sperm, unbleached winter, $1.40; sperm, unbleached Fall, $1.35; lard oil, No. 1 winter, 90c. a 95c.; refined rosin, 30c. a 40c.; camphene, 47c. a 49c.; fluid, 54c. a 56c.

PAINTS.—Litharge, American, 7c. per lb.; lead, red, American, 7c.; lead, white, American. pure, in oil, 8c.; lead, white, American, pure, dry, 7¼c.; zinc, white, American, dry, No. 1, 5c.; zinc, white, French, dry, 7¼c.; zinc, white, French, in oil, 9½c.; ochre, ground in oil, 4c. a 6c.; Spanish brown, ground in oil, 4c.; Paris white, American, 75c. a 90c. per 100 lbs.; vermillion, Chinese, $1.12½ a $1.22; Venetian red, N. C., $1.75 a $2.31¼ per cwt.; chalk, cash, $4.75 per tun.

PLASTER-OF-PARIS.—Blue Nova Scotia, $2.75 a $2.87½ per tun; white Nova Scotia, $3; calcined, $1.20 per bbl.

RESIN.—Common, $1.55 per 310 lbs.; strained, No. 2, &c., $1.60 a $2; No. 1, per 280 lbs. $2 a $3.25; white, $3.50 a $4; pale, $4.50 a $5.50.

SPELTER plates, 5c. a 5¼c. per lb.

STEEL.—English cast, 14c. a 16c. per lb.; German, 7c. a 10c.; American spring, 5c. a 5½c.; American blister, 4½c. a 5½c.

TALLOW.—American prime, 11c. per lb.

TIN.—Banca, 32½c. a 33c.; Straits, 30½c.; plates, $7.25 a $9.60 per box.

TURPENTINE.—Crude, $3.62½ per 280 lbs.; spirits, turpentine, 46c. per gallon.

WOOL.—American, Saxony fleece, 50c. a 55c. per lb.; American full blood merino, 46c. a 48c.; extra, pulled, 45c. a 50c.; superfine, pulled, 37c. a 41c.; California, fine, unwashed, 24c. a 32c.; California, common, unwashed, 10c. a 18c.; Mexican, unwashed, 11c. a 14c.

ZINC.—Sheets, 7¼c. a 7½c. per lb.

The foregoing rates indicate the state of the New York markets up to November 3.

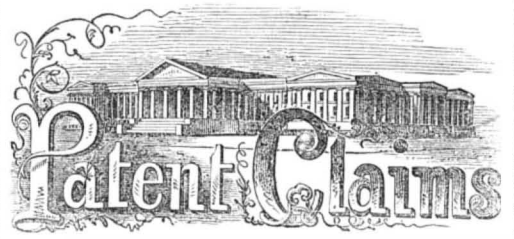
The demand for cotton has been more active last week. With the excellent crop of the present season it is expected that the cotton manufacturers will do a most thriving business. The dry goods market has also slightly improved, which is a good indication, yet there are many complaints in regard to the limited amount of business which was done during the month of October. A very large export of heavy domestic goods for China took place during the week, and drillings, for export to Cuba, Africa and other places, are in good request.

There has been a very good demand for flour; the stock on hand in this city, however, is heavy and increasing. This is caused by the expectation of northern navigation being stopped at an early date.

American hemp has slightly improved in price; and, were it as carefully selected and treated as the Italian and Russian, it would bring as good prices. At present, it sells for just about one-half the price of the foreign. This is a question for our hemp-growers.

Honey is an article of considerable importance in our market, and the whole supply might be raised at home; but we depend for at least one-half of the quantity used upon Cuba and St. Domingo.

India-rubber still ranges very high in price; the fine quality being from 65c. to 70c. per lb. As the manufacture of india-rubber goods is now carried on extensively in our country, a rise in prices must be the result of the high price of raw material.



ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING NOVEMBER 1, 1859.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

25,936.—E. R. Arnold, of Providence, R. I., for an Improvement in Cut-off Valves of Steam-engines:

I claim, first, Making the tappet, C, Fig 4, and the ends of the jointed valve rods, D D', Fig. 3, inclined in a direction at right angles to their lines of motion, and combining and arranging them substantially as set forth.

Second, The combination of the regulator, with a tappet, constructed and operated substantially as described for the purpose specified.

25,937.—L. S. Ballou, Jr., of New York City, for an Improvement in Shirts:

I claim a shirt, formed by having its yoke made of two pointed projections, c c, extending down from the shoulders, or inclined front ends, a, of the yoke, on the shoulder blades of the wearer, in such a manner as to leave a recess, d, between the projections, which recess extends upward nearly to the neckband, substantially as and for the purpose set forth.

25,938.—H. A. Barnes, of Milwaukie, Wis., for an Improvement in Railroad Car Couplings:

I claim the arrangement of the latch, in the draw-head, A, in combination with the cam, D, latch or hook connection, B, lever, or treadle, G, substantially in the manner and for the purpose described.

25,939.—E. F. Barnes, of Brooklyn, N. Y., for an Improved Method of Protecting Telegraphic Instruments against Atmospheric Electricity:

I claim the application and use in a telegraphic line, or in connection with telegraphic instruments of a vessel, A, containing acidulated water, or fluid, as described, and having a platinum or other metallic wire, B, of better conductability than the contents of such vessel passing through such vessel, and connecting by one end with the main wire, and by the other with the telegraphic machine, the whole arranged substantially as and for the purposes set forth.

I claim, also, in combination, or connection with such vessel of fluid, A, and wire, B, the arrangement of the metallic points, b c d, on the wire of the main line, and extending into the fluid in A, substantially as and for the purpose set forth.

25,940.—J. Bartholomew, of Union, N. Y., for an Improvement in Machines for Packing Flour in Barrels:

I claim, first, The combination with the packing screw, or its equivalent, of a cylinder or its equivalent, so that the flour will be first packed within the said cylinder, or its equivalent, and then discharged therefrom, in a packed state into a bag, barrel, or other receptacle, as set forth.

Second, The arrangement of the rod, I, levers, Q K, block, l, connected with the shaft, J, by the cord or chain, n, and the hub or boss, k, on screw-shaft, F, for the purpose of automatically discharging the packed flour from the cylinder or measure, M.

Third, The arrangement of the lever, D, with pinion, E, attached block, l, hub, or boss, k, levers, O P, and spring, t, for the purpose of automatically discharging the pinion, E, from the wheel, G, and thereby stopping the rotation of the screw, G, at the proper time.

25,941.—R. L. Bate and James Caulkins, of Adrian, Mich., for an Improved Coffee-roaster:

We claim the combination of the stationary cylindrical chamber, revolving skeleton stirrer, and outer vertical cylindrical casing, all constructed in the manner and for the purposes set forth.

[This coffee-roaster economizes heat in roasting, and condenses all the smoke arising from the coffee during the operation, while it prevents the disagreeable odor from escaping into the room.]

25,942.—G. W. R. Bayley, of Brashear, La., for an Improvement in Rails for Railroads:

I claim the reversible Z rail for railways, that is to say, I claim the rail with its stem placed inside of the vertical center of its head outside of the vertical center of its base, with the inner and outer portions of its head and of its base of different thickness and form, with its head and its base similar in transverse section as to outline, though reversed as to relative position and connection to the rail stem; the stem being nearest to the inside thick lip of the rail head, and to the outside thick lip of the rail base, while the thin lip of the rail base is inside, and the thin lip of the rail head is outside, substantially as described and specified.

25,943.—Benjamin G. Beadle, of Memphis, Tenn., for an Improvement in Cotton Gins:

I claim, first, Uniting the knuckles, or projections, b, on the ribs, by a back or brace c, extending through the series, for the purpose of strength, and for keeping them in proper position, substantially as set forth.

25,944.—T. G. Beecher, of Beaver Dam, N. Y., for an Improved Farm Fence:

I claim my improved method of construction, as shown, namely, combining with the posts, A, arranged as described, the rails, B, made removable and replaceable by means of the locking device, e f g, substantially as specified.

25,945.—W. H. Bitzer, of Muscatine, Iowa, for an Improved Arrangement of Devices in Shingle Machines:

I claim the arrangement of the frame, Q, and planer, R, upon the self-adjusting swinging-bar, P, and the combination of the parts thus arranged with the pivoted lever, U, and reciprocating carriage, F, as and for the purpose shown and described.

[This invention relates to an improvement in that class of shingle machines in which the shingles are cut in taper form from the bolt by a circular saw, and at the same time planed at one side. The invention consists in the employment or use of a reciprocating bolt carriage, rotary planer and circular saw, whereby the desired work may be performed by a very simple mechanism, one readily manipulated and kept in proper working order.]

25,946.—Wm. G. Budlong, of Hartford, Conn., for an Improvement in Sewing-machines:

I claim the combination of the adjustable groove segment, with the looper bar, J, fitted loosely therein, feeder arrangement, P Q R, operating rod, X, having cams, 1 2 3, secured thereto, and connected by arms, c d e G, the whole being arranged and operating substantially in the manner as and for the purpose described.

25,947.—S. F. Burdett, of Keokuk, Iowa, and Henry Still, of Leavenworth City, K. T., for an Improved Scale for Cutting Boots and Shoes:

We claim, first, The lines of average ankle, heel, instep, and ball measures, running from the point "A" (in Fig. 1 "A") or any other given point that will produce the same result, with the lines of increase and decrease intersecting them at such an angle, and at such a distance from each other as will produce the purpose set forth.

Second, We claim the device of so arranging the heel and instep measures, as in the Figs. No. 1 B, and No. 2 B, that any required size of said heel and instep may be marked at one stroke with or without the combination of the average measures of the same,

Third, We claim the one-third of an inch increase and decrease of average heel measures upon the different lengths of lasts, or such portions of an inch as will produce the same effect, substantially as set forth.

25,948.—Levi Burnell, of Milwaukie, Wis., for an Improvement in Water-meters:

I claim the arrangement of the hollow arbor, B, with a narrow slot, j, in combination with the lips, h, formed by the inner edges of the buckets, D, substantially as and for the purpose specified.

[This invention relates to that class of water-meters in which a bucket wheel is employed, which is caused to rotate by the gravity of the water as it enters one of the buckets after the other. The water enters the buckets through a narrow slot in the arbor around which the bucket wheel rotates, and the inner edges of the buckets form lips which cut off the water from each bucket as soon as the same is filled, and cause the stream to pass into the next succeeding bucket. Each bucket is caused to fill to the exact hight by means of a counterpoise, whereby the water is measured correctly and also weighed at the same time.]

25,949.—Robt. H. Champlin, of East Greenwich, R. I., for an Improved Washing-machine:

I claim the combination of the rounds or slats and springs with the cylinder, when constructed and operating substantially as described.

25,950.—Edw. C. Clay, of Malden, Mass., for an Improved Electro-magnetic Burglar's Alarm:

I claim the combination in an electric burglar's alarm of a galvanometer, with a resistance coil and an automatic switch, for the purpose of indicating the point where a burglar is attempting to effect an entrance, substantially as described.

I claim, also, the combination in an electric burglar's alarm of a galvanometer and a bell, with suitable mechanism to ring it, for the purpose of simultaneously giving an alarm and of indicating the place of attack.

I claim, also, the use in a burglar alarm of a regulating coil, in combination with the resistance coils, substantially as described, for the purpose of maintaining a constant relation between the strength of the current, and the varying resistance of the circuit, when the respective resistance coils are included.

25,951.—J. W. Cochran, of New York City, for an Improvement in Projectiles for Ordnance:

I claim constructing and combining the body of the projectile and its shirt or case of soft metal, substantially as described, to wit, so that the passages for the gases of the exploded powder are formed partly in the body of the projectile, and partly in the shirt or case with their entrances in the shirt or case, without perforating the body of the projectile, and that the shirt can be carried separately from the body, and slipped on when required for use in such manner as to remain secured thereon during the flight of the projectile, as set forth,

25,952.—Nathan Cope, of Cincinnati, Ohio, for an Improvement in Slide Valves of Steam-engines:

I claim the combination with the valves, B C, of the grooves, g g, and notches, h h, as and for the purposes set forth.

25,953.—Thomas Crossley, of Rockville, Conn., for an Improvement in Electrotype Printing-blocks:

I claim an electrotype printing-block for printing fibrous and textile fabrics which is prepared from a mold formed of at least three different lengths of type, as represented at c d e, so as to have a highly-raised printing-face composed of metal margins surrounding a felt or other equivalent ductile or plastic substance, to lift and carry the color, substantially as represented.

25,954.—Bradford Dean, of Clayville, N. Y., for an Improved Meat-slicer:

I claim the arrangement of the knives, I and I', knives, D and D', and the adjustable guide, B, as shown and described, substantially as and for the purpose specified.

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25,955.—James Cumming, of Boston, Mass., for an Improvement in Steam-engines:

I claim, first, The combination with a square piston chamber, A, of a square piston which is constructed of a series of angular sections of packing, D, joined loosely together by lap joints, and made adjustable and kept steam-tight, substantially in the manner and for the purpose set forth.

Second, In combination with the above, the use of a square piston-rod, C, and a square stuffing-box, F F, substantially in the manner and for the purpose set forth.

25,956.—John K. Derby, of Jamestown, N. Y., for an Improved Stave-jointing Machine:

I claim, first, The employment of two conical cutter-heads, B B, provided with suitable knives, C, connected by teeth, d, or other means, so as to insure a simultaneous rotation, and placed on frames, A A, connected by hinges or joints, a a, substantially as and for the purposes set forth.

Second, The attaching of the knives, C C, to the cutter-heads, B B, in reverse positions, so that they will cut from the centers of the staves outwards, for the purpose specified.

[The object of this invention is to obtain a machine for jointing staves that may be adjusted to suit staves for various sized casks. The invention consists in the employment of two conical cutter-heads provided with cutters peculiarly arranged and fitted to frames connected by a joint so that the cutter-heads may be placed more or less angularly with each other, and the desired object attained.]

25,957.—George Dieffenbach, of New York City, for an Improved Method of Making a Hard Compound of Rubber:

I claim the application of artificial heat to a composition of matter consisting of sulphate of alumina and other ingredients, substantially as described for the purpose of curing and hardening the said composition, substantially as specified.

25,958.—William Doulin, of Youngstown, Ohio, for an Improvement in Hanging Carriage Bodies:

I claim in combination with any of the ordinary springs of a carriage an elliptic spring, G, on the reach of the wagon, said elliptic spring being constructed and arranged in the manner and for the purpose set forth and explained.

25,959.—C. Duckworth, of Hartford, Conn., for an Improvement in Locks:

I claim the tumbler, E, slotted arm, D, attached to the bolt, B, lever, G, or its equivalent, and the key, F, provided with lever, H, combined and arranged substantially as and for the purpose set forth.

[The object of this invention is to obtain a simple, economical lock, one that may be opened with facility in a legitimate way and still be unpickable or proof against burglars. The invention consists in the employment of a series of tumblers arranged with a slotted arm attached to the bolt, and used in connection with a key of peculiar construction, the whole being so arranged as to effect the desired end.]

25,960.—J. A. Dufield, of McHenry, Ill., for an Improvement in Harvesters:

I claim wheels, a a, provided with pins, c c, and diamond-shaped F F, in combination with cutter-bar, P, shaft, D, wheel, D, and lever, H, the whole being combined and arranged in relation to each other substantially as and for the purposes set forth and described.

25,961.—Aaron Eames, of Kalamazoo, Mich, for an Improved Fly Trap:

I claim the combination of the fly receptacle, B, register, C, rotating-clearer, F, bait board, H, and gate, G, arranged substantially as and for the purposes set forth.

[This invention consists in the employment of a wire-cloth fly receptacle, register, bait-board, annular gate, and rotating-clearer, whereby an exceedingly simple and efficient article is obtained for the intended purpose.]

25,962.—Thaddeus Fairbanks, of St. Johnsbury, Vt., for an Improvement in Platform Scales for Railroads, &c.:

I claim the arrangement of the supporting standards and the loops or supports of the longitudinal levers and platform, with respect to each other, and so as to extend within or into the space between the side timbers of the platform, substantially as specified.

25,963.—Wm. A. Fosket and Elliott Savage, of Meriden, Conn., for an Improvement in Sewing-machines:

We claim, first, The presser-foot in combination with the spring and with the needle stock, when so arranged that by the operation of the latter, the force of the spring will be taken from the presser-foot at the time the feed of the cloth is to be given, that is, when the needle is out of the cloth, but without raising the said presser-foot from the cloth, in the manner and for the purposes substantially as described.

Second, The needle-guard constructed and operating substantially as set forth, in combination with the needle and with the thread-carrier or looper.

Third, We claim so combining and arranging the double-jointed stock of the thread-carrier with the two levers, o and r', as that the said parts shall vibrate in the same plane, and also that the said stock shall form a link between the two levers which are operated to have their arcs of vibration opposed to each other, whereby, with the least throw of the said levers, the greatest vibration of the thread-carrier is produced.

25,964.—James P. Gage, of New York City, for an Improvement in Mills for Crushing and Pulverizing Quartz, &c.:

I claim, first, The combination of cast-rolls upon wrought-iron shafts (the rolls cast solid upon the shafts) with the wrought-iron box or frame the conicals upon the shaft, and the sliding cast-iron journal-boxes, arranged and operating for the purposes and in the manner described.

Second, The combination of the rollers, the case or frame, D, the box, and the wide shoe, and the diagonal plates, operating in the manner and for the purposes described.

25,965.—Wm. Hall, of St. Louis, Mo., for an Improvement in Bran Dusters:

I claim the combination of the flange, M, with its arms, t, and the head, o, with the scuppers, N, with the brushes and fans, K and P, substantially as described for the purpose specified.

25,966.—C. A. Harper, of Fort Worth, Texas, for an Improvement in Converting Reciprocating into Rotary Motion:

I claim producing the rotary motion of shaft, S', and saw, C, by the reciprocating racks, R R', in combination with the gear-wheel, a, spring-pawls, p, drum, D, shafts, S, and wheels, B and W, substantially as described.

25,967.—John Holroyd, of Washington City, D. C., for an Improvement in Projectiles for Fire-arms:

I claim constructing the projectile with the reversed curved grooves A and B, on the rear and front, substantially as and for the purpose set forth.

25,968.—Henry Hudson, of Three Springs, Pa., for an Improvement in Sewing-machines:

I claim the carrying of a self-feeding automatic stitch-forming device (like that shown and described, or its equivalent) over the surface of the stretched or stationary fabric, substantially as and for the purpose set forth.

25,669.—Wm. Iams, of Baltimore, Md., for an Improvement in Hydrants:

I claim the movable cylinder, B, and tube, C, when combined with the fixed piston, E, upon the supply pipe, A, and so constructed and arranged in relation to the supply pipe that its elevation shall open a direct communication with the main, in the manner and for the purposes specified.

25,970.—A. Livingston Johnson, of Baltimore, Md., for an Improvement in Machines for Preventing Engines and Railroad-cars from being thrown from the Track:

I claim, in combination with a locomotive and a pioneer safety-car in advance of it, the bars, A, fastened to one and extending into loops or mortises in the other, to prevent the lighter car from leaving the track, or one from mounting or riding on the other, in case of accident or sudden stoppage, substantially as described.

I also claim, in combination with the locomotive and pioneer safety-car, an advance of the link or drag-bar, B, so connected thereto, as that the propelling force transmitted through it shall tend to hold the forward part of the safety-car to the track, substantially as described.

25,971.—Geo. W. La Baw, of Jersey City, N. J., for an Improved Life Boat:

I claim the arrangement of ribs, D, with the main rib, K, and keel, E, and cutwaters, I I; the whole being constructed substantially as and for the purpose specified.

25,972.—Sylvester Littlefield, of Alfred, Maine, for an Improvement in Sawing-machines:

I claim, first, Combining with a circular saw, A, on a vibrating adjustable arm, D, an auxiliary saw, G, substantially as and for the purpose described.

Second, Arranging an arm, B, with two guides, C, in such a manner that it vibrates on the arbor of the saw, and that it can be raised and lowered instantaneously, substantially as and for the purpose described.

[An auxiliary saw is arranged before a circular saw or an arm in such a manner that the same takes off the bark, and clears the track before the main saw, and that it can be adjusted to a log of any size. Another arm with two guides is brought in such relation to the main saw that it, together with the guides, can be adjusted according to the diameter of the saw, and that it can be raised and lowered instantaneously.]

25,973.—I. I. Magee, of Fernandina, Fla., for an Improved Machine for Unloading Vessels:

I claim the arrangement of the frames, A and H, with rollers, C and I, and with screws, G and J, or their equivalent, substantially as and for the purposes specified.

[By the aid of this machine much time and labor can be saved in loading and unloading vessels, or in moving heavy loads from place to place, in storehouses, factories &c. Each bale, package, or box is placed on rotary rollers which cause the same to travel to the desired place, making room, almost simultaneously, for a succeeding package so that all the goods can be placed on the rollers in rapid succession and without delay.]

25,974.—C. K. Marshall, of Vicksburgh, Miss., for an Improved Apparatus for Printing Addresses on Newspapers, &c.:

I claim, first, A chain of plates or solid links, having characters of the description substantially as described, placed, cut or set into the face of its links, and arranged to wind in scrolls upon one pulley or roller from another, substantially as and for the purposes set forth.

Second, The combination of the above with an inking-device that supplies the characters made on the faces of the links, with ink, and with a stamping-device, which will cause the respective links of the chain, as they come into play, to produce a clear impression upon the article being directed or superscribed, substantially as and for the purposes set forth.

Third, The employment of an inclined hopper having openings in its bottom and furnished with a spring-stop, in combination with the revolving bulk-feeding arms, substantially as and for the purposes set forth.

Fourth, The combination with the features embraced in the third claim, of the raking single-feeding device, substantially as and for the purposes set forth.

Fifth, The use of the scroll-winding Post-office indicating-belt, with the superscribing-chain or other superscribing-device, substantially as and for the purposes set forth.

Sixth, The manner, substantially as described, of effecting a combination between said belt and chain.

Seventh, The combination of the features embraced in the fifth claim with the "mail"-assorting box, substantially as and for the purpose set forth.

Eighth, The use of the State-indicating belt with the Post-office indicating belt, and with a superscribing device, substantially as and for the purposes set forth.

Ninth, The organization of an apparatus by means substantially as described, for accomplishing, by one continuous operation, the several results specified.

25,975.—John Meyerhofer, of New York City, for an Improvement in the Process of Preparing Paper Pulp:

I claim, in making paper impervious to water, mixing the alkaline solution of rosin with the pulp, and then adding what is known as English sulphuric acid, and after the sheets have been formed, drying them by contact with heated metallic surfaces, all substantially as and for the purposes specified.

25,976.—Cæsar Neumann, of New York City, for an Improvement in Skeleton Hoop Skirts:

I claim combinining a series of spring hoops, as set forth, by means of a series of twisted cords, and thus forming a skeleton skirt, as specified.

25,977.—John S. McClure, of Mobile, Ala., for an Improved Method of Mounting Ambrotypes:

I claim the employment of a concave back ground or surface, D, in combination with an ambrotype picture, substantially as and for the purposes shown and described.

[The object of this invention is to give a better effect to an ambrotype or other picture, on a transparent surface, by putting it up on a background with a suitable landscape or other design. By arranging the background on a concave surface, the picture appears to stand out from the same and its effect is materially enhanced.]

25,978.—J. E. Palmer, of St. Louis, Mo., for an Improved Tackle Block:

I claim the form of the block in the inside and the form of the pulley, when the two are combined and arranged substantially as described and for the purposes specified.

25,979.—John W. Palmer, of Port Republic, Va., for an Improvement in Beehives:

I claim providing the described beehives with one or more partitions, I, with opening, a m e' c and g g', and with feed boxes, c, which contain separating boxes, D, constructed substantially as described, the whole being arranged and used in the manner and for the purpose set forth.

25,980.—Walter Ralston, of Manchester, England, for an Improvement in Embossing and Finishing Woven Fabrics. Patented in England Nov. 23, 1858:

I claim the employment of grooved, fluted, engraved, milled, or otherwise indented rollers of metal, wood, or other suitable material, driven at a greater speed than the bowl or bowls connected with them, so as to exert a rubbing or friction upon the fabric submitted to their action, and thereby produce an indefinite variety of pattern as well as a bright finish or lustre, and also reversing the operation by giving the bowl a quicker motion than the pattern roller.

25,981.—Charles E. Rowan, of New York City, for an Improvement in Machines for Polishing Rice:

I claim, first, The combination of the conductors, H H', when constructed substantially as described, and secured within a loose wire cloth cylinder, A, with the scouring disks, G G' G'', constructed stantially as shown, and secured to the driving shaft, B, as set forth, so that the friction of the grain will cause the cylinder, A, to revolve and lift and deliver the grain through the machine, all as specified.

Second, In combination with the parts described, I claim the tubes, k*, and openings, l m, arranged as shown, so that the dust may escape and air may enter to cool the contents of the cylinder, A, during the scouring operation.

Third, I claim placing the feeding screw, E, upon the same shaft, B, that carries the scouring disks, G G' G'', as set forth.

25,982.—Wm. R. Satterly, of Setauket, N. Y., for an Improvement in Reefing Fore-and-aft Sails:

I claim the combination with and above the triangular sail, G, of another triangular sail, H, which has a boom, C, attached to it, so that when the two sails and boom are put together they form the ordinary fore-and-aft sail, operating in the usual manner; but when the sail, H, and its attached loom, C, are removed, as described, the small triangular sail, G, remains, all substantially as set forth.

[This invention consists in dividing a fore-and-aft sail in a line running diagonally from its upper and inner corner to its lower and outer corner, thus making two triangular portions, and so applying these two portions of the sail, in combination with the boom and a detachable gaff, that when, in hard weather, it is desirable to reduce sail, the gaff and outer portion can be expeditiously disconnected from the inner portion and from the boom, and that the upper corner of the inner portion can be connected with the throat halyard and hauled up to its place without the boom, thus effecting the reduction of sail more quickly than can be done by the ordinary mode of reefing and obviating the chafing of the reef on the boom, by making the inner portion of the sail constitute a trysail.]

25,983.—Nathaniel Snow, Jr., of Boston, Mass., for an Improved Steering Apparatus:

I claim the described steering apparatus, consisting essentially of the wheel, I, pinion, G, rods, D, and yoke, C, arranged and operating substantially as described.

25,984.—N. Spofford, of Haverhill, Mass., for an Improved Bit-stock:

I claim arranging the socket, A, of a brace with a slot, a, as described in combination with a thumbscrew, b, and projections, d, or their equivalents, substantially as and for the purpose specified.

[The object of this invention is to lessen the labor of fitting the shanks of bits to the sockets of braces. It consists in arranging the socket with a slot that divides said socket into two parts, which are forced together by means of a thumbscrew, so that they adapt themselves to different sizes and different bevels of the shanks of bits, and the lower end of the socket is furnished with a projection that serves to retain the bits with quite a moderate pressure of the thumbscrews.]

25,985.—E. N. Sprinkle, of Marion, Va., for an Improved Churn:

I claim, as an improvement on the churn patented to Hatfield & Goldsmith, on July 13, 1858, the combination of the perforated obliquely arranged dashers, C C C, with the single inclined stationary guard, F, substantially as and for the purposes set forth.

25,986.—Robert Steel, of Philadelphia, Pa., for an Improvement in the Construction of Burners for Vapor Lamps:

I claim the combination of a metallic gas-generating chamber and burner, applicable to a lamp, chandelier, or other gas fixture, for the purpose of generating vapor or gas from burning fluid and consuming the same as fast as it is generated, thereby producing a superior artificial gas light, as is described and particularly set forth in the specification.

25,987.—John G. Treadwell, of Albany, N. Y., for an Improvement in Stoves:

I claim providing the door, H, with an inclined projection, a, on one side and a hinged rack bar, d, on the other, when said door is used in connection with the cross bar, c, and with the damper, D, as constructed, the whole being arranged and operated substantially as and for the purpose described.

25,988.—George Whitcomb, of Springfield, Ohio, for an Improvement in Mole Plows:

I claim the construction of a flexible mold by the combination of sections which are not attached to each other, but by being held in place by the chain, J, or its equivalent, as set forth.

25,989.—Luke H. Ward, of Marlboro', Mass., for an Improvement in Pegging-machines:

I claim the particular arrangement and combination of the feeding apparatus, consisting of the levers, R Q and O, spring, P, and wheels, N L, in connection with the lever, U, and its stud, I, and the awl and driver operated by the levers, W and X, in connection with the peg-feeding apparatus and pointed saw for cutting off the pegs, when constructed and operating as set forth and described.

25,990.—Simeon Wood, of Worcester, Mass., for an Improved Auger:

I claim the combination of the chipping bit or bits with a band or hook, having teeth or cutters on its bottom edge, substantially as and for the purpose set forth.

25,991.—R. F. Wolcott, of Claremont, N. H., for an Improvement in Platform Scales:

I claim, first, The combination of the two graduated wheels, Q R, screw, s, and bar, r, arranged substantially as and for the purpose set forth.

Second, Attaching the lever, I, to the platform, B, levers, H H, and rod, J, when the above parts are arranged to operate as described.

Third, The construction and arrangement of the fulcrum arms, g, of the shaft, D, projections, b, and plates, e, of the hangers, C, and the plates G I, of the beams, F F, substantially as and for the purpose set forth.

25,992.—Jean Louis Baudelot, of Havencourt, France, assignor to Henry Migeon, of Wolcottsville, Conn., for an Improvement in Apparatus for Cooling Liquids. Patented in France April 13, 1856:

I claim a cooling apparatus for liquids, composed of a vertical range of pipes passing the liquid successively from the lower to the upper pipes in said range, in combination with the perforated trough, d, or its equivalent, supplying the other liquid which trickles over the surface of said range of pipes, as set forth.

I also claim, in such a cooling apparatus, a series of teeth or projections on the under side of the horizontal pipes, for the purpose of conducting or distributing the liquid falling successively from one pipe to the other, substantially as specified.

25,993.—Edward Behr and L. Frœlich (assignor to Edward Behr) of New York City, for an Improvement in Skate Straps:

We claim the rod, F, fitted longitudinally in the stock, A, provided with screw sections, c f, with cylinders, E H, fitted thereon, and one end of the heel and toe straps, D G, attached to said cylinders, the

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latter being provided with the ratches, d k, into which the pawls, e l, catch, substantially as and for the purpose set forth.

[The object of this invention is to obtain a facile mode of adjusting the straps of the skate, so that the latter may be quickly and snugly secured to the foo , and also readily detached therefrom.]

25,994.—Thos. Bishop (assignor to himself and James M. Bishop), of Plainville, Conn., for an Improvement in Tea and Coffee Pots:

I claim the arrangement of the area, E, flanges, X, upon the lid, G, with the apertures, F and D, in the manner as and for the purpose described.

25,995.—D. G. Chase, of Boston, Mass., assignor to George Parr, of Buffalo, N. Y., for an Improved Shank-laster:

I claim the jointed cross bars, A A, provided with the swivel jaws, E E, and swivel nuts, a a, in connection with the right and left screw shaft, C, the whole being arranged substantially as and for the purpose set forth.

[This invention relates to a new and improved shank-laster, an implement or tool used by shoemakers for drawing leather over lasts. The object of the invention is to enable the leather to be drawn on the last and tacked thereto with greater facility than usual.]

25,996.—John Colville, of Wilmington, N. C. (assignor to himself and T. L. Colville, of same place), for an Improved Method of Adjusting Circular Saws:

I claim the expansion ring or plate of copper, G, or any other suitable metal capable of being expanded, for setting or adjusting the saw properly upon the shaft at any given point or points, when the same is interposed between the saw and fixed collar, as set forth.

25,997.—Wm. Elwell, of Gardiner, Maine (assignor to himself and N. O. Mitchell, of same place), for a Fly Trap:

I claim the two boxes, A A, of a quadrangular or other shape, provided with sliding glass tops and sliding bottom, G, in combination with the perforations, B, surrounded with projecting pins for the purposes and when the same are all arranged in the manner set forth.

[This invention and improvement in traps for ensnaring flies consists of two quadrangular boxes, each of which is furnished with a sliding glass top, for inducing the flies to pass from the lower to the upper box after they have been caught, for killing them with the fumes of sulphur or other suitable substance, a provision being made for this purpose in the upper box. The lower box contains perforations through its sides, the holes being surrounded by pointed pins, so as to permit the flies to readily pass through the holes, but prevents their escape when once in. The bait will be molasses, or anything sweet and attractive, which is placed in a sliding drawer.]

25,998.—John A. Evarts, of West Meriden, Conn. (assignor to Homer Curtis, of same place), for Improved Cast-metal Pulleys:

I claim forming the core, D, of the sheel, B, by covering the wheel, A, with the sand, b, and having the hole, c, made through the core, so that, in casting the sheel, the pintle or axis, E, of the wheel will be cast simultaneously with the shell, and the wheel, when the sand, b, is removed, be properly adjusted with the shell substantially as described.

25,999.—John Jewell Flanders, of Manchester, N. H. (assignor to himself and E. G. W. Bartlett, of same place), for an Improvement in Rotary Pumps:

I claim the combination of the revolving annular inverted gear, the pinion, S, and stationary crescent, U, the whole being arranged to operate in the case substantially as described for the purposes set forth.

26,000.—H. K. Symmes, of Newton, Mass. (assignor to himself and R. W. Holman, of same place), for an Improvement in Apparatus for Manufacture of Coal Oil:

I claim, first, An oil retort, A, in combination with the gas retort, D, or its equivalent, for the purpose of saving the gas which escapes from the oil retort, and to improve its quality, substantially as specified.

Second, In combination with the two retorts, A and D, I claim the pump, G', or its equivalent, for the purpose of imparting to the gas the necessary pressure, substantially as set forth.

26,001.—Isaac Goodspeed, of Norwich, Conn. (assignor to himself and George A. Mansfield, of Boston, Mass.), for a Pocket Alarm:

I claim the pocket, thief and burglar-alarm, constructed in the form and manner represented and described.

I also claim the combination and arrangement of the independent lever, K, adapted to cap and cock the alarm, and while both the captube and hammer are arranged within, and do not project outside the shell or case.

26,002.—Stephen H. Head, of Boston, Mass. (assignor to himself and Wm. P. Parrot, of same place), for an Improvement in Steam-boilers:

I claim, in combination with the furnaces, B C, and the lateral passage, E, and damper, e, chamber, F, located at the front of the furnaces, and between them and flues, for the purpose and in the manner substantially as set forth.

26,003.—George M. Phelps, of Troy, N. Y. (assignor to the American Telegraph Company), for an Improvement in Telegraphing-machines:

I claim, first, Producing from a magneto-electric battery, the momentary electric currents required for actuating the printing-mechanism by giving momentary motion to the armature or other current-inducing part of the magneto-electric battery, by means of a set of finger-keys, which, when depressed, are controlled in their action upon the current-inducing part of the magneto-electric battery by a mechanical contrivance which constantly moves in harmony with the unintermittingly-revolving type-wheel, substantially as described.

I also claim increasing the capability of the instruments for telegraphing by so increasing the speed of the transmitting-device and type-wheel, in relation to the motion of the parts which perform the printing, that two or more types shall pass the platen while the printing-mechanism is acting once, as described.

I also claim turning the cylindrical platen while each impression is being made, by means of rings of teeth, R and T, upon the type-wheel and platen, as and for the purpose set forth.

And, finally, I claim making a revolving wheel or shaft, U or i, turn the corrector, M, armature, C, or another wheel or shaft, a certain fixed distance, with the same speed as itself, at any time and any desired number of times, by the use of a ratchet-wheel, V or h, catch, W or f, guide, X or k, and detent, K or e, all arranged together, and, with the said driving and driven wheel or shaft, for conjoint operation as set forth.

26,004.—Charles A. Gale, of Boston, Mass. (assignor to Albert S. Hall, of Malden, Mass., and A. R. Davis, of Cambridge, Mass.), for an Improved Clothes-dryer:

I claim the combination, substantially as described, of the mantel r shelf and the folding slats, arranged and operating as set forth for he object specified.

RE-ISSUES.

William M. Griffith & Co., of Martin's Ferry, Ohio (assignees of William H. Orr, of said Martin's Ferry), for an Improvement in Machines for Cleaning Grain. Patented July 13, 1859; re-issued Nov. 1, 1859:

We claim the arrangement and application of the stirrer, K, in the described relation to the riddle or shoe of a grain-separating machine, operating in the manner and for the purpose set forth.

E. K. Root, of Hartford, Conn., for an Improvement in Revolving Fire-arms. Patented Dec. 25, 1855; re-issued Nov. 1, 1859:

I claim combining the driving-pin that works in the grooves to rotate and hold the breech in line with a slide below adapted to the reception of and to be operated by the trigger-finger, and acting on the lock on the end of the back motion, to liberate the cock or hammer, and discharge the load, substantially as described.

And I also claim combining the plunger with the many-chambered rotating-breech pistol or other fire-arm, by means of a lever with a cogged sector engaging the cogs of a straight rack, substantially as and for the purpose specified.

DESIGNS.

Charles T. Foot, of Bristol, Conn., for a Design for Clock Cases.

Thomas Hardgrove and Samuel Hardgrove, of Richmond, Va., for a Design for a Trade-mark.

Allen Leonard, of Hartford, Conn., for a Design for a Base for Casters.

Allen Leonard, of Hartford, Conn., for a Design for Caster Handles.

William H. Lewis, of Glastenbury, Conn., for a Design for Fork or Spoon Handles.

Garretson Smith and Henry Brown, of Philadelphia, Pa. (assignors to Cox, Whitman & Cox, of same place), for a Design for Stoves.

NOTE.—In our last number, we took occasion, in referring to the number of patents issued last week, to indicate the large proportion of cases which passed through this office. In summing up the patents granted this week, ending Nov. 2d, we find the whole number to be SIXTY-EIGHT, of which TWENTY-EIGHT (or nearly one-half) were secured through the agency of Munn & Co., publishers of this paper.

W. H. W., of Pa.—We will attend to your request next week.

W. S., of Ill.—Water can be boiled by forcing heated air into it through a pipe. Cane juice has been evaporated in this way, but for making white sugar the process is objectionable, as the dust in the air gives the sugar a slightly greyish tinge.

A. C. F., of Penn.—You say that the grooves of the Enfield rifle twist once round in the length of the barrel instead of one-half, as stated on page 255 of the present volume of this journal. Our minute description was copied verbatim from one of the English mechanical papers.

G. F. J. C., of N. C.—You could not procure a patent for the use of vulcanized india-rubber in place of ebony for the manufacture of the black keys of the pianoforte key-board. The mere change of substance is not patentable.

P. F. of Ohio.—We have carefully examined the sketch of your alleged improvement in mowing-machines, and we fail to discover in the arrangement anything new or patentable. The same device is covered in the patent of Fitzhugh. See page 28 of the present volume.

G. C., of Wis.—You will find a notice of the suit of Hussey vs. McCormick on page 225 of this journal. Hussey claims the combination of the open slotted finger and scolloped sickle. The case went against McCormick, and we have good authority for asserting that he has since recognized Hussey's claims to this device.

H. H., of Mass.—It will be of no use for you to press your views upon our consideration any further. We do not believe your discovery will ever amount to anything valuable; we could not, therefore, endorse it. Your professed willingness to pay has no effect upon us. Our columns are not open to "paid puffing."

D. D. F., of N. Y.—Your proposed method of applying water power to two valve buckets connected with a lever and drum, to produce a reciprocating motion, appears to be similar in principle to that of Mr. E. Bishop's, illustrated on page 313, Vol. II. of the SCIENTIFIC AMERICAN.

S. E. S., of Iowa.—The patent of Messrs. Pierce & Beardsley, for a new method of tanning, is not what is called the "short process." It is only a more simple and superior system of using other tanning substances than the extract of bark. We have seen good leather made by it; and believe that the time is not far distant when such processes must come into general use.

W. C. L. R., of Ala.—We believe it would be an economical operation to introduce gas and water by pipes into your institute. The best method of drying your clothes is by a centrifugal drying machine; but if you were to convey the heat of the fires in the boiler furnaces of your wash-house, by flues, into a long drying room, you might dry all the clothes of your boarders by the waste heat which now escapes up the chimney.

A. M., of N. Y.—Silicate of soda is unfit for plugging teeth. You can reduce an acidulous solution of gold by evaporation; the moisture will pass off in the form of steam and leave the dry oxyd. You can do the same with cyanide of gold.

B. F. M., of Ind.—The protective power of a lightning-rod depends upon the quality of its metal, its thickness, length and perfect continuity from the apex to the moist earth below. The earth owes its conducting power to the moisture which it contains, and the conducting power is increased with the quantity of mineral salts in the moisture. Pure water is a very poor conductor, salt water a very good one. A lightning-rod of ½-inch square iron and 40 feet high, if carried down into the moist earth below, will not have its conducting capacity reduced.

M. & B., of Ill.—The enamel to which you allude on iron vessels and registers is composed of the same ingredients as porcelain, and is fused on the metal in a kiln. A white enamel is composed of two parts of ground glass, two of calcined tin and one of borax, all fused together, and poured into water when taken from the furnace. It is then ground in water to a paste, and applied to the metal with a brush. The iron must be scoured clean before this enamel paste is put on, or it will crack off easily afterwards. Calcined lead, employed as a flux in the enamel paste, enables it to fuse at a low heat; but it never should be used in culinary vessels, as it is poisonous, and liable to be decomposed by vegetable acids. The red, blue, green, and other colored enamels are formed with mineral oxyds; such as oxyd of iron for black, oxyd of copper and chrome for green, oxyd of gold and manganese for purple, and pure oxyd of gold for a beautiful red.

S. A., of La.—You will find an illustration of Fawkes' steam plow on page 161 of the present volume. He has secured a patent for his improvement. In the construction of a steam plow you will, upon reflection, perceive that invention can rest only upon certain minor details in adapting or combining a steam carriage and plows to this purpose. You are not correct in assuming that, comparatively, nothing has been done in this branch of improvement. Several modifications have been patented in England, and the subject has received a good deal of attention in that country. The scarcity of field hands has rendered it a desirable acquisition to the English farmer.

F. R., of Va.—Liverpool salt contains about 98 per cent chloride of sodium, two per cent muriate of lime and magnesia and a trace of sulphate of lime. The fine white Cheshire table salt contains 99·80 per cent chloride of sodium; it is very pure. Turks' Island salt is about as pure, but we do not know the per centage of chloride of sodium in Virginian and New York salt.

Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, Nov. 5, 1859:—

T. S. B., of N. Y., $25; D. R. L., of Miss., $30; A. H., of Texas, $15; D. W. C., of N. Y., $15; A. F., of N. Y., $55; L. A. B., of N. Y., $30; W. W. W., of Conn., $60; W. T., of Mass., $25; M. F., of Ind., $35; H. M. S., of Maine, $25; J. J. A., of N. C., $30; O. S., of N. Y., $30; J. C. W., of Ill., $30; G. M. A., of Ill., $30; A. L., of Mich., $30; M. & A., of R. I., $25; C. R. K., of Pa., $15; S. E. C., of Mass., of $80; A. E., of Ohio, $25; W. B. G., of N. Y., $30; B. & B., of Tenn., $30; W. C. C., of N. Y., $25; G. W. M., of Tenn., $30; F. S. M., of N. Y., $30; W. B. D., of Conn., $30; J. G. of Conn., $30; J. S. C., of Pa., $30; H. B. J., of N. J., $30; C. P. B., of Ohio, $25; J. R. E., of La., 30; B. M. C., of Mass., $25; M. & H., of Mass., $30; S. B. C. & Co., of N. Y., $250; C. C., of Iowa, $25; S. S. G., of Mass., $50; G. B. M., of Mich., $25; N. D., of N. J., $30; A. L., of Ga., $30; J. T. P., of N. Y., $55.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Nov. 5, 1859:—

W. T., of Mass.; J. E. C., of Mass.; T. S. B., of N. Y.; J. W., of N. Y.; M. F., of Ind.; C. C., of Iowa; C. P. B., of Ohio; A. F., of N. Y.; J. H., of N. J.; W. E. S., of N. Y.; A. A., of N. Y.; A. H., of Texas; G. A. L., of Mich.; R. F., of N. J.; G. B. M., of Mich.; O. M. A., of N. Y.; O. S., of Mass.; E. A. W., of L. I.; A. E., of Ohio; J. Y. S., of Pa.; M. & A., of R. I.; J. C. G., of Cal.; W. C. C., of N. Y.; B. M. C., of Mass.; H. M. S., of Maine; W. & R. F., of N. Y.; G. M. A., of Ill.

Literary Notice.

UTILITY OF THE SLIDE-RULE. By Arnold Jilson, of Woonsocket, R. I.

This is a neat pocket companion for the operative-mechanic, being a treatise on instrumental arithmetic. By its aid, manufacturers, artisans and operatives can make their own calculations; and without the loss of time and perplexity of the ordinary mathematical process. A portion of the volume is devoted especially to matters pertaining to the cotton manufacture, and will be found both instructive and valuable. For sale by the author.

Hints to our Patrons.

BACK NUMBERS.—We shall hereafter comme e sending the SCIENTIFIC AMERICAN to new subscribers from the time their subscriptions are received, unless otherwise directed; the back numbers can be supplied from the commencement of the volume to those who may order them. It is presumed most persons will desire the back numbers, and such as do will please to so state at the time of sending in their subscriptions; they can, however be supplied at any subsequent period.

INFALLIBLE RULE—It is an established rule of this office to stop sending the paper when the time for which it was prepaid has expired, and the publishers will not deviate from that standing rule in any instance.

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IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure Patents for Inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other Agency in the world. The long experience we have had in preparing Specifications and Drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH-STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business we have Offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris, and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to Inventors. Any one can take out a Patent there.

A pamphlet of information concerning the proper course to be pursued in obtaining Patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the Principal Office or either of the Branches. We also furnish a Circular of information about Foreign Patents.

The annexed letters from the last two Commissioners of Patents we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

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A MESSIEURS LES INVENTEURS—AVIS IMportant.—Les inventeurs non familiers avec la langue Anglaise, et qui preferereraient nous communiquer leurs inventions en Francais, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront recues en confidence.

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PATENT EXTENSIONS.—ALL PATENTS FOR Inventions, granted by the United States during the year 1845, will expire by their own limitations during the current year (1859) UNLESS EXTENDED ACCORDING TO LAW. The statute provides for the extension of Patents for an additional term of SEVEN YEARS, the grant being made to the inventor himself, or if deceased, to his heirs and administrators. The EXTENDED TERM inures solely to the benefit of the inventor or his heirs. Assignees or owners of rights under the first term of the Patent have no rights whatever in the extended term. The inventor or his heirs may, however, sell their interests in the Extension prior to the grant thereof, in which case the Extended Patent, when granted, becomes the exclusive property of such purchaser. Applications for Extensions must be made at the Patent Office at least 65 days prior to the extension of the Patent. The undersigned, having had great experience in Patent business, will promptly prepare the various documents and prosecute Extension cases on moderate terms. For further information address

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Zur Beachtung für Erfinder.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu adressiren an

Munn & Co.,
37 Park Row, New-York,

Auf der Office wird deutsch gesprochen.

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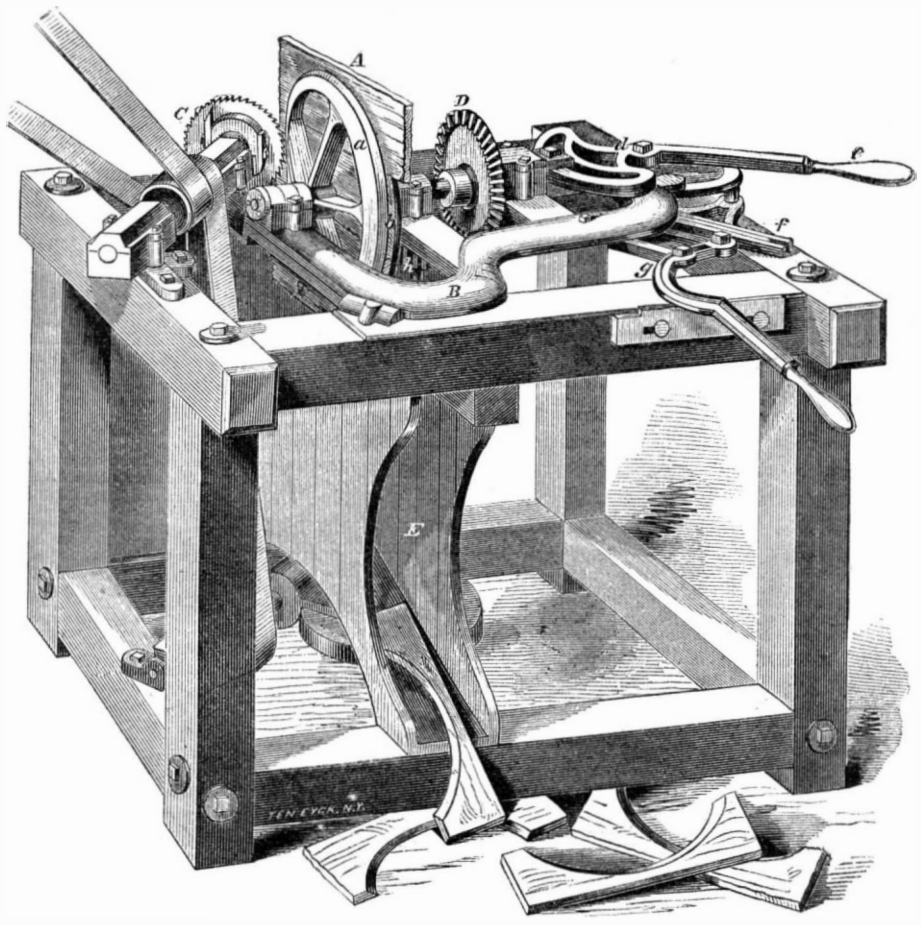
MACHINE FOR SAWING OUT BARREL HEADS.

The time seems to be rapidly approaching when all cutting of wood, whatever may be the form desired, will be done by steam or water power. This is the department of invention in which this country has taken the most decided lead, and, from the great number of new devices which we are continually called on to record, the approach towards perfection appears to be now more rapid than ever before. We illustrate at this time, a machine for sawing out barrel heads.



GREENWOOD'S MACHINE FOR SAWING BARREL HEADS.

The "stuff," A, of which the barrel head is to be formed is held between two clamps, *a* and *b*, which have independent shafts in the same line. The clamp, *b*, is secured firmly against the end of the shaft, *c*, the other end of which is connected by a sliding box and pin with the groove in the cam, *d*. Thus the clamp, *b*, may be drawn away by means of the lever, *e*, from its fellow, *a*, or pressed toward it, to release or confine the stuff, A, between the two. The frame, B, to which the several parts described above are attached, slides diagonally upon the principal frame of the machine in guides, one of which is shown at *f*. While the stuff is being secured between the clamps, the frame, B, is drawn back away from the circular saw, C; and after the stuff is secured, this frame is pushed along by means of the cam, *g*, so as to bring the stuff in contact with the circular saw. This motion throws the beveled wheel, D, into gear with the beveled pinion, *h*, which produces a slow revolution of the clamps, *a* and *b*, carrying around the stuff in contact with the circular saw, which cuts it out in the form of a barrel head. The plane of the circular saw is placed at an angle with the plane of the clamps, and thus the saw forms one basil of the edge of the head, while the cutters, secured to the side of the saw, form the other basil; the edge coming directly into the angle, where the cutters meet the side of the saw. The concave pieces sawed from the head fall down the chute, E, and the head, when released from the clamps, falls down another chute on the other side of the machine. The circular saw is of course made dish-shaped, in order to cut stuff thus held diagonally with its plane.

The patent for this invention was issued (through the Scientific American Patent Agency) June 21, 1859, to John Greenwood, of Rochester, N. Y., who may be addressed at that place for further information in regard to it, or inquiries may be addressed to Daniel Bowker, New York City.

THE GREAT BALLOON.

On the first day of November, Mr. Lowe commenced the inflation of his great balloon (which was fully described on page 202, present volume of the SCIENTIFIC AMERICAN), at Reservoir-square, the site of the Crystal Palace. The gas employed is the same as that which is used for lighting the streets and houses of the city. A ten-inch pipe being laid to one of the mains of the Manhattan Gas Company, the throat of the balloon was tied tightly about its end, and the gas began to flow into the biggest bag which the world has ever seen. The ground has been enclosed with a high board fence, and 25 cents is charged for witnessing the inflation. Within the enclosure is a tent where are exhibited the several portions of the apparatus which is to accompany the balloon. A wood basket, some eight feet in diameter and four feet high, is suspended by numerous small ropes to the netting which covers the balloon. Beneath the basket is one of Francis's life-boats made of corrugated sheet iron; rope-ladders leading from a man-hole in the bottom of the basket down to the boat. In the bow of the boat is a fan, some five or six feet in diameter, to be driven, it is said, by one of Ericsson's air-engines. The engine is on the ground, in constant operation, driving a fly wheel. The lime stove for cooking, the grappling-iron for stopping the balloon in alighting, the drag for the same purpose in case the descent should be made into the sea, and one of the copper vessels for carrying a supply of gas condensed, are all on hand and exhibited. The idea of using an Ericsson engine and fan to raise the balloon, is so absurd that we suppose these things will be omitted when the actual ascent takes place. In the middle of the enclosure the great yellow monster was beginning (when we saw it) to swell up its head; already requiring a number of heavy sand-bags, which were hooked upon the netting about it to prevent it from flying upwards. The gas can be furnished by the company only in limited quantities each day, as their regular supply to the city must, of course, be continued. But when his balloon is filled, Mr. Lowe persistently affirms that he shall surely soar away across the Atlantic upon his certainly most desperate and daring of all adventures.

OPENING OF THE COOPER INSTITUTE.

On Wednesday evening Nov. 2d, the "Cooper Institute" was opened with appropriate ceremonies. An address was delivered by Dr. John W. Draper, and the secretary announced the formation of the several free classes, the evenings on which they would meet, and the teachers by whom the instructions will be given. They are as follows:—

Mathematics by Professor Hendrick; Monday, Wednesday and Friday.

Mechanical and Physical Science by Professor Reuben; Monday, Wednesday and Friday.

Chemistry by Professor Draper; Tuesday and Thursday.

Architecture and Free-hand Drawing; Monday, Wednesday and Friday.

Mechanical Drawing; Tuesday and Thursday.

Vocal Music by Dr. Guilmette; Saturday.

All of these lessons commence at half-past seven in the evening, except the lessons in vocal music, which commence at half-past six. Immediately after the hour of beginning, the doors are locked and none admitted afterwards. The educational exercises are all free, and seats are reserved for those who apply beforehand for tickets. There is also in the building a beautiful reading-room, supplied with the best periodical literature of the day, which is open from 8 A.M. to 10 P.M., and is also free to all, male and female.

The Cooper Union is an association formed to administer the large property which has been left by Peter Cooper, one of the mechanics of New York, to this (his native) city, for the intellectual culture of its people. This property consists of a large building situated at the junction of the Bowery and the Third and Fourth-avenues, and extending from Seventh to Eighth-streets. The ground floor is occupied as stores, the rental of which will furnish a perpetual revenue to the Union, while the remainder of the building is mainly divided into halls, lecture rooms, reading-rooms, school-rooms, picture gallery, library, &c.; the entire building, with all its revenues, being devoted to mental culture. Mr. Cooper has not waited till his death to extract the last particle of selfish enjoyment possible from his wealth before he gave it away, but has bestowed this large property upon his less fortunate fellow-men during his lifetime. So depraved are some natures, that some men have abused Mr. Cooper for his course, even in this matter; and he has been subjected to much unjust criticism, with possibly some little that was just. The opening exercises may have been stupid, as they undoubtedly were, and the architecture of the building may not suggest the genius and taste of skilled architects; but the same may be said of many of our buildings, and these are trifling matters of detail. The donation itself is a most wisely-directed and a most magnificent benevolence. And as the old gentleman stood up at the close of the exercises, and told how, for thirty long years, he has carried this scheme in his mind, how he has thought about it and toiled for it by night and by day; what king or potentate, what man soever, is there on all the wide earth who is in a position not to envy him in that hour of the crowning of his noble enterprise?

We have received an interesting letter from Gustavus Muller, of this city, in which he pays a well-merited tribute to the large-hearted benevolence of Mr. Cooper in laying this noble foundation. We regret that we have not room for its publication in full, Mr. Cooper deserves the thanks of the whole world for this great gift.

MECHANICS, INVENTORS, MILLWRIGHTS, AND MANUFACTURERS.

The SCIENTIFIC AMERICAN is a paper peculiarly adapted to all persons engaged in these pursuits, while to the Farmer, Housekeeper, and Man-of-Science, it will be found of equal interest and use.

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